9 instances are found with new low bound optimum values (please check k\_1000 103, k\_1000 108, k\_1000 166, k\_1000 183, k\_1000 342, k\_1000 349, k\_1000 361, k\_1000 372, k\_1000 385).

All results are showed as follows:

k\_1000 0

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_1.sm case j12010\_1.sm

39 716.9241142272949 s [112, 153] 0.9009009009009009 [0, 0, 0, 0, 8, 14, 2, 8, 4, 22, 16, 27, 14, 6, 23, 16, 25, 26, 33, 6, 4, 28, 43, 34, 38, 10, 8, 4, 9, 13, 25, 37, 23, 26, 41, 33, 20, 38, 56, 20, 19, 38, 50, 45, 25, 43, 37, 34, 50, 52, 37, 60, 46, 45, 26, 45, 51, 43, 51, 37, 28, 50, 45, 35, 34, 56, 45, 12, 37, 62, 27, 41, 52, 48, 57, 42, 43, 46, 42, 65, 47, 35, 37, 52, 52, 60, 55, 57, 56, 38, 56, 76, 66, 59, 71, 19, 59, 59, 69, 62, 55, 84, 61, 71, 89, 41, 76, 76, 77, 66, 69, 74, 84, 87, 92, 78, 95, 70, 105, 88, 102, 112] 0

k\_1000 1

opm 66

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_10.sm case j12010\_10.sm

59 726.479665517807 s [67, 73] 1.5151515151515151 [0, 0, 0, 0, 5, 6, 10, 3, 3, 1, 8, 3, 19, 5, 5, 7, 7, 9, 19, 8, 17, 1, 8, 15, 4, 24, 4, 4, 4, 7, 8, 11, 22, 29, 6, 38, 13, 9, 18, 30, 19, 5, 15, 8, 11, 20, 28, 7, 35, 13, 16, 15, 9, 13, 14, 4, 37, 25, 13, 15, 6, 18, 20, 24, 15, 38, 13, 14, 30, 9, 26, 17, 23, 23, 28, 31, 18, 11, 17, 16, 31, 31, 25, 28, 11, 38, 22, 32, 42, 27, 26, 29, 38, 39, 26, 39, 38, 23, 26, 30, 23, 38, 40, 44, 30, 45, 36, 47, 38, 48, 52, 45, 48, 45, 52, 54, 58, 46, 58, 62, 52, 67] 0

k\_1000 2

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_2.sm case j12010\_2.sm

23 285.1850712299347 s [91, 192] 0.0 [0, 0, 0, 0, 8, 8, 16, 16, 7, 7, 15, 10, 30, 1, 17, 16, 1, 10, 21, 17, 13, 7, 13, 25, 19, 32, 19, 35, 18, 20, 23, 21, 33, 10, 17, 28, 18, 33, 28, 10, 24, 19, 17, 40, 22, 28, 33, 20, 1, 40, 42, 38, 50, 7, 22, 20, 4, 20, 17, 18, 40, 33, 19, 29, 28, 24, 50, 23, 35, 37, 58, 25, 47, 43, 56, 46, 30, 54, 33, 26, 38, 26, 52, 46, 47, 25, 41, 61, 46, 11, 58, 63, 22, 48, 28, 46, 58, 56, 30, 49, 40, 58, 53, 68, 58, 67, 54, 50, 61, 44, 66, 56, 56, 77, 67, 68, 67, 33, 81, 69, 68, 91] 0

k\_1000 3

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_3.sm case j12010\_3.sm

29 702.9186880588531 s [103, 110] 4.040404040404041 [0, 0, 0, 0, 9, 10, 2, 14, 14, 20, 2, 20, 31, 2, 28, 14, 21, 31, 18, 9, 18, 28, 12, 43, 28, 34, 25, 28, 11, 34, 34, 20, 12, 26, 48, 28, 42, 25, 39, 36, 31, 21, 16, 11, 32, 30, 38, 40, 41, 23, 10, 48, 44, 50, 31, 37, 45, 47, 9, 33, 48, 48, 58, 45, 21, 17, 55, 38, 37, 17, 63, 63, 28, 48, 33, 63, 64, 63, 47, 23, 58, 19, 50, 50, 68, 13, 45, 27, 36, 73, 71, 75, 55, 55, 63, 16, 57, 63, 48, 73, 84, 70, 78, 67, 80, 62, 63, 85, 85, 78, 63, 68, 73, 58, 81, 83, 91, 93, 101, 90, 90, 103] 0

k\_1000 4

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_4.sm case j12010\_4.sm

26 711.090940952301 s [103, 117] 8.421052631578947 [0, 0, 0, 0, 3, 3, 8, 13, 13, 21, 24, 28, 8, 21, 33, 46, 47, 46, 24, 14, 40, 47, 50, 28, 50, 53, 8, 13, 8, 21, 6, 6, 28, 3, 9, 38, 13, 30, 47, 13, 6, 46, 53, 10, 19, 52, 31, 33, 57, 33, 40, 38, 40, 13, 46, 52, 13, 59, 56, 50, 14, 23, 60, 47, 19, 38, 12, 59, 48, 31, 26, 10, 23, 46, 13, 29, 61, 23, 69, 49, 57, 58, 80, 49, 55, 55, 61, 64, 67, 70, 52, 67, 61, 48, 26, 76, 56, 74, 69, 16, 64, 79, 74, 61, 80, 76, 54, 79, 67, 69, 69, 74, 85, 82, 82, 90, 94, 92, 97, 99, 89, 103] 0

k\_1000 5

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_5.sm case j12010\_5.sm

32 713.207820892334 s [98, 175] 1.0309278350515463 [0, 0, 0, 0, 8, 8, 14, 6, 6, 4, 6, 10, 17, 7, 18, 8, 14, 16, 17, 16, 23, 25, 4, 10, 4, 18, 18, 8, 25, 10, 26, 25, 9, 34, 33, 41, 13, 31, 18, 11, 31, 42, 36, 37, 51, 42, 37, 26, 20, 25, 24, 41, 10, 31, 42, 31, 46, 26, 45, 16, 45, 26, 36, 15, 54, 57, 29, 42, 46, 34, 25, 52, 50, 54, 52, 32, 34, 65, 34, 48, 57, 32, 19, 33, 52, 36, 55, 42, 20, 41, 44, 61, 66, 57, 43, 45, 26, 42, 57, 40, 45, 61, 72, 66, 59, 59, 71, 72, 59, 72, 63, 71, 58, 63, 72, 82, 91, 82, 96, 62, 75, 98] 0

k\_1000 6

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_6.sm case j12010\_6.sm

7 41.2753005027771 s [92, 119] 0.0 [0, 0, 0, 0, 6, 16, 16, 16, 23, 6, 23, 20, 19, 23, 2, 27, 23, 28, 9, 29, 38, 26, 8, 37, 11, 2, 24, 28, 11, 29, 11, 9, 11, 8, 37, 29, 35, 35, 36, 36, 11, 42, 42, 11, 27, 24, 44, 34, 27, 36, 39, 42, 9, 11, 12, 50, 41, 50, 36, 44, 31, 37, 13, 38, 36, 13, 31, 50, 38, 44, 41, 8, 16, 51, 13, 39, 42, 56, 41, 42, 45, 9, 27, 47, 62, 38, 45, 45, 48, 54, 21, 43, 51, 50, 59, 37, 44, 34, 59, 61, 62, 71, 46, 72, 54, 62, 55, 56, 59, 64, 56, 76, 64, 63, 69, 61, 69, 75, 85, 72, 76, 92] 0

k\_1000 7

opm 79

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_7.sm case j12010\_7.sm

47 715.4636826515198 s [83, 98] 5.063291139240507 [0, 0, 0, 0, 9, 16, 5, 9, 16, 2, 16, 5, 22, 16, 26, 2, 7, 17, 9, 37, 23, 2, 15, 29, 9, 29, 12, 31, 15, 13, 15, 22, 7, 8, 7, 16, 22, 17, 14, 15, 14, 19, 23, 22, 32, 33, 15, 32, 26, 39, 18, 29, 20, 22, 24, 45, 36, 30, 24, 33, 34, 32, 16, 39, 49, 23, 42, 33, 53, 26, 39, 37, 39, 26, 41, 46, 34, 33, 26, 36, 20, 13, 24, 26, 56, 13, 42, 39, 46, 49, 35, 49, 17, 36, 45, 49, 53, 33, 64, 34, 53, 32, 55, 65, 47, 51, 60, 64, 55, 60, 73, 49, 61, 59, 56, 61, 69, 66, 78, 75, 76, 83] 0

k\_1000 8

opm 114

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_8.sm case j12010\_8.sm

27 611.906923532486 s [114, 135] 0.0 [0, 0, 0, 0, 6, 8, 6, 11, 6, 19, 10, 10, 18, 20, 16, 22, 22, 27, 22, 23, 22, 43, 15, 16, 8, 50, 35, 31, 38, 39, 30, 22, 46, 10, 30, 26, 30, 39, 39, 27, 21, 39, 46, 45, 28, 44, 34, 38, 33, 39, 42, 33, 33, 50, 38, 59, 50, 43, 59, 21, 60, 67, 51, 48, 34, 21, 46, 59, 55, 24, 18, 45, 39, 18, 60, 67, 16, 46, 51, 66, 55, 43, 15, 24, 72, 65, 62, 55, 70, 42, 60, 65, 55, 75, 77, 86, 81, 73, 59, 85, 88, 71, 67, 96, 73, 92, 70, 41, 70, 97, 80, 76, 72, 83, 38, 83, 92, 97, 107, 106, 70, 114] 0

k\_1000 9

opm 77

the random choice case path in j120 ./rcpsp/j120.sm/j12010\_9.sm case j12010\_9.sm

9 51.430508613586426 s [77, 95] 0.0 [0, 0, 0, 0, 5, 10, 6, 16, 12, 12, 8, 12, 13, 16, 23, 5, 6, 23, 18, 16, 15, 25, 5, 14, 21, 18, 16, 24, 14, 17, 28, 17, 26, 17, 24, 35, 14, 33, 6, 20, 8, 30, 12, 16, 23, 27, 24, 21, 23, 30, 31, 31, 38, 20, 32, 30, 18, 37, 17, 32, 25, 40, 26, 17, 36, 20, 35, 47, 35, 17, 26, 34, 39, 25, 30, 38, 33, 28, 17, 33, 37, 39, 40, 36, 36, 54, 37, 36, 18, 24, 48, 45, 40, 40, 43, 53, 26, 34, 44, 10, 38, 53, 54, 35, 24, 54, 57, 44, 60, 54, 53, 58, 42, 46, 59, 58, 64, 65, 71, 47, 70, 77] 0

k\_1000 10

opm 155

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_1.sm case j12011\_1.sm

11 1425.6623594760895 s [197, 209] 27.09677419354839 [0, 0, 0, 0, 2, 2, 11, 9, 11, 6, 15, 22, 25, 20, 14, 35, 45, 8, 55, 19, 23, 69, 48, 66, 8, 20, 78, 49, 23, 85, 51, 91, 63, 76, 35, 52, 11, 52, 60, 73, 35, 66, 15, 85, 94, 61, 18, 24, 60, 105, 53, 49, 101, 96, 91, 31, 78, 45, 61, 114, 105, 69, 60, 43, 55, 101, 72, 22, 103, 116, 32, 125, 133, 63, 45, 10, 125, 133, 35, 154, 137, 146, 69, 142, 86, 120, 49, 148, 164, 163, 147, 111, 169, 156, 139, 168, 163, 171, 156, 72, 85, 103, 182, 120, 154, 123, 169, 96, 129, 174, 179, 148, 185, 180, 191, 173, 180, 182, 190, 182, 194, 197] 0

k\_1000 11

opm 163

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_10.sm case j12011\_10.sm

11 1912.8794000148773 s [211, 803] 29.447852760736197 [0, 0, 0, 0, 18, 3, 9, 10, 88, 24, 28, 10, 1, 18, 88, 1, 33, 17, 33, 33, 43, 50, 97, 19, 46, 34, 41, 62, 91, 19, 28, 78, 69, 69, 81, 3, 97, 41, 34, 142, 41, 100, 108, 75, 97, 88, 74, 58, 58, 93, 52, 103, 100, 4, 80, 102, 117, 127, 118, 135, 148, 145, 52, 148, 118, 75, 59, 114, 43, 148, 102, 68, 127, 50, 28, 106, 161, 80, 108, 93, 146, 78, 134, 118, 154, 127, 110, 127, 153, 1, 168, 91, 103, 175, 120, 161, 145, 182, 162, 170, 153, 136, 175, 177, 170, 112, 163, 191, 182, 191, 161, 192, 198, 178, 198, 182, 195, 198, 205, 195, 205, 211] 0

k\_1000 12

opm 145

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_2.sm case j12011\_2.sm

11 1133.0546312332153 s [192, 246] 32.41379310344827 [0, 0, 0, 11, 20, 27, 27, 93, 24, 97, 58, 81, 78, 86, 27, 30, 5, 34, 42, 117, 88, 42, 122, 5, 101, 45, 53, 85, 89, 121, 101, 5, 93, 44, 14, 6, 120, 108, 98, 102, 24, 87, 155, 1, 11, 45, 72, 124, 58, 131, 7, 46, 125, 93, 95, 61, 64, 16, 135, 54, 134, 38, 105, 63, 97, 138, 106, 26, 27, 2, 122, 5, 76, 115, 143, 53, 78, 69, 18, 38, 154, 16, 110, 136, 56, 7, 34, 159, 134, 133, 109, 161, 146, 110, 135, 139, 18, 140, 139, 146, 131, 71, 148, 72, 176, 61, 163, 64, 182, 157, 165, 154, 171, 155, 115, 170, 180, 176, 171, 187, 188, 192] 0

k\_1000 13

opm 186

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_3.sm case j12011\_3.sm

11 1629.5135295391083 s [225, 426] 20.967741935483872 [0, 0, 0, 0, 10, 33, 20, 34, 29, 41, 44, 79, 23, 7, 13, 7, 33, 49, 30, 33, 34, 65, 77, 20, 57, 86, 41, 68, 41, 81, 34, 99, 65, 58, 95, 23, 23, 80, 30, 65, 50, 10, 52, 95, 61, 86, 104, 77, 68, 32, 75, 110, 109, 11, 119, 91, 109, 104, 69, 119, 90, 44, 99, 158, 115, 75, 124, 126, 157, 61, 132, 132, 119, 160, 176, 142, 78, 49, 90, 133, 149, 149, 121, 86, 163, 177, 41, 164, 167, 172, 147, 160, 177, 135, 119, 77, 99, 110, 126, 140, 147, 188, 121, 196, 185, 177, 160, 188, 179, 190, 197, 198, 197, 200, 212, 183, 208, 208, 207, 216, 218, 225] 0

k\_1000 14

opm 177

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_4.sm case j12011\_4.sm

11 2150.0284719467163 s [211, 250] 19.2090395480226 [0, 0, 0, 77, 2, 3, 9, 18, 28, 6, 8, 9, 17, 6, 86, 45, 7, 16, 36, 79, 38, 33, 61, 54, 28, 166, 60, 18, 91, 79, 18, 93, 19, 65, 61, 36, 88, 82, 125, 21, 47, 28, 55, 77, 75, 96, 33, 29, 63, 126, 118, 45, 29, 79, 174, 93, 75, 111, 71, 152, 28, 100, 75, 101, 101, 111, 9, 106, 146, 66, 29, 101, 171, 119, 54, 85, 106, 120, 163, 116, 158, 111, 129, 82, 100, 139, 101, 153, 160, 119, 100, 130, 117, 139, 158, 177, 126, 181, 47, 103, 148, 168, 146, 163, 174, 168, 91, 152, 160, 184, 184, 177, 178, 191, 191, 199, 203, 163, 188, 201, 207, 211] 0

k\_1000 15

opm 191

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_5.sm case j12011\_5.sm

11 1896.1106922626495 s [238, 338] 24.60732984293194 [0, 3, 0, 0, 8, 11, 8, 8, 35, 13, 39, 87, 16, 39, 22, 27, 29, 43, 57, 41, 43, 27, 70, 22, 12, 6, 47, 26, 47, 94, 71, 62, 29, 16, 56, 103, 84, 63, 49, 69, 78, 13, 133, 152, 132, 56, 102, 110, 161, 161, 142, 141, 173, 39, 181, 152, 80, 65, 57, 36, 81, 95, 170, 170, 65, 110, 154, 26, 102, 120, 132, 53, 177, 111, 69, 94, 144, 114, 87, 154, 160, 94, 120, 179, 26, 171, 71, 166, 194, 103, 201, 161, 169, 78, 114, 177, 188, 188, 127, 114, 201, 116, 142, 173, 152, 124, 116, 192, 211, 183, 213, 211, 217, 208, 194, 223, 229, 217, 235, 224, 223, 238] 0

k\_1000 16

opm 189

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_6.sm case j12011\_6.sm

11 1541.5690128803253 s [256, 271] 35.44973544973545 [0, 0, 0, 6, 26, 36, 10, 16, 39, 81, 17, 87, 10, 16, 43, 20, 23, 42, 46, 20, 67, 46, 26, 77, 28, 114, 128, 91, 53, 91, 79, 48, 98, 123, 53, 98, 53, 126, 6, 43, 72, 109, 62, 91, 154, 93, 107, 33, 131, 86, 105, 134, 98, 162, 136, 109, 144, 152, 110, 77, 75, 61, 162, 153, 134, 142, 27, 120, 162, 197, 77, 62, 123, 170, 108, 176, 147, 87, 35, 180, 204, 107, 101, 122, 170, 51, 212, 109, 62, 153, 79, 220, 208, 153, 208, 228, 199, 228, 132, 176, 147, 132, 212, 187, 168, 220, 189, 184, 217, 238, 73, 236, 74, 199, 232, 238, 244, 208, 249, 217, 241, 256] 0

k\_1000 17

opm 148

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_7.sm case j12011\_7.sm

11 746.0122468471527 s [190, 216] 28.37837837837838 [0, 0, 4, 0, 51, 7, 4, 18, 7, 5, 22, 29, 27, 9, 9, 28, 49, 40, 56, 7, 18, 66, 13, 58, 22, 30, 43, 15, 66, 47, 62, 35, 63, 80, 72, 85, 111, 32, 84, 43, 118, 65, 65, 13, 60, 79, 128, 56, 100, 112, 106, 100, 73, 88, 120, 115, 93, 70, 22, 40, 123, 58, 22, 142, 21, 110, 79, 31, 13, 114, 126, 126, 4, 89, 130, 143, 22, 112, 99, 30, 73, 133, 106, 139, 50, 119, 16, 110, 135, 75, 119, 72, 150, 104, 130, 124, 148, 66, 146, 159, 50, 139, 52, 148, 111, 161, 143, 155, 132, 150, 150, 100, 171, 160, 174, 179, 161, 169, 173, 174, 186, 190] 0

k\_1000 18

opm 151

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_8.sm case j12011\_8.sm

11 1518.1655220985413 s [192, 250] 27.1523178807947 [0, 0, 0, 1, 1, 4, 9, 13, 16, 19, 8, 20, 10, 10, 16, 52, 53, 30, 9, 59, 71, 77, 90, 19, 66, 53, 24, 109, 99, 20, 77, 20, 112, 53, 42, 104, 93, 128, 1, 141, 83, 36, 45, 97, 61, 27, 99, 24, 33, 36, 38, 43, 83, 29, 134, 40, 29, 77, 45, 56, 83, 109, 71, 33, 43, 109, 109, 116, 43, 143, 61, 112, 122, 17, 97, 136, 148, 38, 53, 36, 105, 66, 124, 116, 88, 132, 89, 154, 154, 59, 148, 150, 132, 149, 149, 162, 24, 116, 163, 159, 141, 108, 41, 149, 141, 136, 170, 168, 159, 120, 168, 171, 177, 171, 178, 170, 180, 180, 186, 177, 187, 192] 0

k\_1000 19

opm 167

the random choice case path in j120 ./rcpsp/j120.sm/j12011\_9.sm case j12011\_9.sm

11 1583.5612988471985 s [201, 206] 20.35928143712575 [0, 7, 0, 0, 10, 23, 18, 18, 33, 21, 10, 33, 26, 42, 33, 55, 52, 33, 21, 21, 21, 34, 41, 26, 68, 54, 40, 57, 60, 46, 84, 52, 76, 37, 47, 92, 38, 71, 74, 61, 68, 57, 26, 52, 44, 28, 74, 61, 16, 34, 42, 52, 78, 101, 101, 91, 18, 81, 125, 92, 116, 81, 95, 125, 132, 65, 117, 93, 57, 141, 52, 132, 16, 110, 132, 123, 125, 145, 181, 74, 132, 117, 84, 133, 152, 155, 162, 44, 66, 100, 116, 44, 146, 141, 74, 109, 71, 125, 110, 162, 107, 165, 16, 155, 171, 54, 145, 47, 139, 175, 93, 180, 192, 152, 188, 190, 162, 183, 194, 200, 193, 201] 0

k\_1000 20

opm 125

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_1.sm case j12012\_1.sm

11 922.755847454071 s [156, 158] 24.8 [0, 0, 0, 0, 6, 6, 8, 18, 18, 18, 51, 6, 20, 7, 11, 22, 19, 32, 13, 28, 23, 42, 22, 61, 22, 57, 19, 13, 66, 14, 57, 25, 13, 25, 33, 32, 46, 8, 42, 66, 38, 29, 32, 58, 52, 46, 68, 22, 31, 60, 50, 13, 66, 75, 22, 66, 14, 33, 83, 75, 50, 72, 78, 52, 20, 72, 27, 22, 66, 33, 46, 83, 73, 77, 81, 92, 81, 106, 51, 57, 92, 105, 92, 102, 101, 95, 61, 36, 65, 84, 61, 45, 93, 111, 120, 17, 82, 122, 122, 72, 112, 94, 120, 129, 129, 94, 129, 102, 132, 112, 139, 132, 142, 137, 128, 93, 141, 111, 149, 155, 151, 156] 0

k\_1000 21

opm 142

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_10.sm case j12012\_10.sm

11 1008.2302904129028 s [163, 196] 14.788732394366196 [0, 0, 0, 0, 6, 6, 16, 26, 14, 9, 12, 13, 25, 22, 12, 45, 32, 22, 72, 14, 53, 41, 34, 88, 35, 26, 40, 41, 49, 40, 82, 32, 77, 25, 45, 23, 21, 77, 74, 60, 81, 49, 66, 27, 101, 58, 66, 72, 49, 61, 82, 32, 82, 59, 102, 66, 58, 40, 65, 58, 13, 35, 92, 110, 84, 94, 111, 25, 92, 88, 60, 67, 89, 54, 116, 18, 91, 102, 98, 53, 96, 113, 116, 90, 74, 99, 118, 109, 111, 118, 35, 124, 90, 128, 128, 138, 125, 131, 82, 126, 100, 128, 90, 120, 138, 126, 138, 81, 110, 148, 140, 144, 125, 148, 144, 151, 154, 156, 162, 154, 156, 163] 0

k\_1000 22

opm 110

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_2.sm case j12012\_2.sm

12 685.9195809364319 s [133, 1043] 20.909090909090907 [0, 0, 0, 0, 7, 7, 7, 9, 8, 9, 21, 9, 21, 23, 27, 22, 29, 28, 18, 5, 25, 24, 29, 16, 24, 25, 35, 49, 17, 38, 31, 15, 13, 34, 25, 42, 23, 75, 34, 47, 50, 51, 62, 38, 27, 56, 46, 45, 44, 56, 44, 42, 29, 70, 44, 38, 50, 86, 77, 46, 69, 25, 57, 63, 95, 76, 93, 93, 95, 82, 64, 39, 28, 5, 38, 59, 49, 56, 73, 88, 78, 97, 78, 68, 39, 56, 109, 103, 100, 53, 103, 68, 84, 73, 78, 45, 70, 79, 112, 86, 87, 57, 115, 113, 93, 104, 78, 89, 64, 117, 106, 84, 117, 93, 103, 115, 127, 125, 125, 107, 129, 133] 0

k\_1000 23

opm 130

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_3.sm case j12012\_3.sm

11 1230.5977182388306 s [149, 545] 14.615384615384617 [0, 0, 0, 0, 4, 4, 12, 16, 12, 11, 6, 12, 16, 29, 27, 21, 63, 25, 2, 64, 9, 16, 4, 29, 34, 29, 17, 49, 33, 17, 22, 17, 43, 43, 35, 43, 22, 68, 84, 73, 17, 17, 34, 57, 35, 73, 49, 73, 8, 51, 72, 77, 84, 51, 34, 56, 83, 86, 52, 67, 63, 86, 58, 43, 81, 94, 31, 61, 94, 76, 77, 68, 94, 109, 78, 72, 18, 56, 100, 5, 95, 102, 45, 65, 108, 18, 87, 91, 84, 83, 95, 13, 95, 102, 109, 115, 105, 52, 119, 127, 105, 117, 116, 122, 119, 123, 130, 135, 117, 119, 105, 123, 144, 135, 130, 118, 130, 140, 138, 131, 145, 149] 0

k\_1000 24

opm 121

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_4.sm case j12012\_4.sm

12 750.7817258834839 s [144, 224] 19.00826446280992 [0, 0, 0, 0, 50, 8, 10, 14, 41, 14, 15, 55, 25, 25, 25, 44, 32, 24, 57, 34, 53, 66, 10, 33, 34, 34, 34, 49, 34, 61, 34, 47, 66, 70, 33, 32, 73, 75, 51, 16, 52, 75, 52, 44, 82, 32, 16, 93, 14, 92, 44, 39, 92, 32, 71, 53, 47, 54, 41, 54, 34, 62, 49, 88, 57, 44, 53, 73, 57, 78, 47, 57, 99, 112, 102, 84, 99, 78, 103, 67, 93, 78, 51, 119, 74, 47, 62, 38, 106, 96, 73, 129, 40, 92, 65, 62, 108, 93, 103, 77, 134, 84, 112, 54, 122, 126, 118, 103, 112, 126, 129, 137, 71, 116, 138, 120, 104, 122, 140, 131, 143, 144] 0

k\_1000 25

opm 153

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_5.sm case j12012\_5.sm

11 947.6997830867767 s [184, 488] 20.26143790849673 [0, 0, 0, 0, 12, 21, 10, 13, 3, 3, 28, 19, 13, 73, 29, 31, 21, 8, 21, 41, 31, 3, 8, 47, 35, 37, 81, 10, 75, 64, 73, 41, 42, 51, 35, 28, 63, 73, 64, 25, 19, 52, 93, 51, 74, 38, 60, 10, 16, 88, 47, 52, 98, 88, 90, 100, 90, 93, 55, 108, 107, 103, 85, 110, 31, 124, 37, 108, 115, 117, 87, 75, 29, 108, 74, 74, 93, 131, 55, 108, 113, 113, 119, 118, 37, 120, 124, 117, 121, 117, 34, 130, 141, 60, 131, 134, 83, 137, 144, 147, 134, 147, 155, 153, 66, 130, 81, 130, 98, 52, 107, 145, 152, 162, 153, 170, 157, 165, 175, 174, 164, 184] 0

k\_1000 26

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_6.sm case j12012\_6.sm

11 796.7849695682526 s [140, 243] 21.73913043478261 [0, 0, 0, 0, 9, 2, 3, 2, 13, 9, 3, 12, 12, 12, 6, 13, 3, 21, 14, 12, 16, 9, 30, 30, 26, 19, 25, 16, 61, 4, 26, 30, 35, 46, 34, 12, 37, 21, 35, 36, 30, 35, 44, 22, 46, 34, 52, 56, 35, 70, 45, 45, 18, 45, 73, 70, 47, 72, 52, 47, 79, 94, 62, 54, 73, 65, 62, 76, 98, 79, 94, 79, 56, 76, 65, 82, 85, 81, 91, 77, 81, 86, 86, 84, 96, 62, 100, 41, 94, 84, 112, 106, 106, 9, 76, 110, 70, 92, 86, 102, 54, 110, 115, 112, 115, 94, 117, 93, 108, 123, 94, 112, 111, 112, 120, 122, 124, 131, 127, 133, 134, 140] 0

k\_1000 27

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_7.sm case j12012\_7.sm

14 739.9233367443085 s [137, 551] 19.130434782608695 [0, 0, 0, 0, 21, 10, 12, 10, 32, 12, 10, 20, 40, 20, 30, 52, 15, 21, 47, 48, 7, 15, 64, 28, 60, 21, 30, 77, 28, 58, 30, 7, 21, 26, 54, 76, 30, 7, 54, 45, 69, 30, 74, 75, 51, 58, 30, 70, 41, 35, 100, 76, 16, 90, 83, 78, 30, 36, 42, 26, 100, 27, 47, 100, 46, 50, 60, 50, 61, 36, 36, 52, 66, 66, 75, 84, 102, 108, 93, 111, 75, 96, 90, 83, 109, 71, 100, 49, 62, 45, 114, 62, 42, 32, 92, 71, 86, 45, 92, 58, 93, 98, 80, 90, 108, 110, 96, 70, 109, 119, 98, 38, 101, 106, 106, 119, 121, 129, 130, 121, 126, 137] 0

k\_1000 28

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_8.sm case j12012\_8.sm

14 721.0851209163666 s [141, 162] 25.892857142857146 [0, 0, 0, 0, 1, 11, 7, 7, 7, 16, 26, 5, 21, 26, 31, 13, 30, 17, 19, 13, 49, 13, 43, 16, 33, 26, 52, 17, 24, 44, 23, 31, 11, 34, 55, 46, 38, 23, 33, 54, 57, 40, 66, 34, 64, 43, 87, 41, 51, 75, 68, 89, 41, 46, 81, 80, 95, 100, 65, 64, 105, 50, 71, 95, 23, 23, 15, 55, 87, 27, 33, 30, 53, 73, 71, 64, 25, 78, 92, 43, 105, 76, 52, 65, 56, 81, 93, 74, 111, 118, 102, 86, 62, 111, 122, 78, 31, 76, 111, 113, 88, 117, 87, 103, 97, 113, 102, 127, 118, 113, 118, 121, 133, 56, 67, 123, 121, 105, 127, 139, 128, 141] 0

k\_1000 29

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12012\_9.sm case j12012\_9.sm

13 720.8849325180054 s [121, 122] 21.0 [0, 0, 0, 0, 17, 7, 3, 3, 8, 14, 4, 13, 9, 9, 56, 39, 14, 9, 22, 22, 24, 24, 8, 28, 8, 42, 26, 35, 24, 66, 35, 22, 22, 55, 34, 36, 71, 15, 54, 22, 42, 25, 11, 51, 75, 68, 24, 4, 29, 64, 56, 13, 35, 42, 23, 77, 47, 41, 42, 42, 52, 67, 35, 45, 50, 61, 44, 67, 64, 36, 76, 71, 85, 29, 75, 26, 85, 69, 71, 59, 81, 64, 32, 27, 35, 77, 92, 95, 96, 84, 67, 71, 81, 75, 68, 82, 52, 99, 80, 96, 104, 58, 82, 89, 92, 54, 89, 99, 94, 34, 96, 104, 108, 109, 101, 109, 107, 104, 110, 114, 115, 121] 0

k\_1000 30

opm 121

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_1.sm case j12013\_1.sm

16 769.1266551017761 s [143, 220] 18.181818181818183 [0, 0, 0, 0, 4, 4, 10, 33, 10, 17, 10, 15, 8, 24, 29, 17, 24, 48, 4, 57, 24, 37, 6, 41, 24, 73, 43, 68, 43, 31, 42, 81, 43, 29, 7, 26, 45, 37, 29, 47, 28, 87, 71, 48, 39, 41, 39, 75, 34, 53, 45, 17, 17, 75, 26, 30, 62, 8, 32, 44, 78, 57, 78, 94, 64, 54, 81, 34, 102, 8, 52, 62, 41, 30, 86, 87, 92, 58, 78, 91, 94, 105, 87, 99, 69, 87, 72, 13, 100, 109, 113, 88, 53, 113, 109, 114, 101, 79, 124, 101, 95, 120, 106, 113, 117, 113, 78, 115, 69, 117, 73, 113, 124, 115, 119, 132, 117, 126, 135, 133, 128, 143] 0

k\_1000 31

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_10.sm case j12013\_10.sm

20 732.5943217277527 s [111, 141] 27.586206896551722 [0, 0, 0, 0, 6, 2, 2, 2, 14, 17, 11, 14, 24, 30, 11, 6, 30, 6, 32, 16, 24, 28, 3, 34, 3, 20, 19, 46, 34, 24, 12, 24, 24, 24, 37, 19, 41, 51, 33, 49, 41, 37, 34, 45, 12, 57, 43, 20, 16, 41, 35, 48, 41, 37, 12, 35, 25, 52, 62, 14, 43, 77, 67, 62, 52, 71, 85, 57, 55, 69, 72, 64, 17, 76, 39, 59, 30, 55, 13, 62, 79, 71, 76, 91, 83, 85, 67, 18, 29, 59, 37, 17, 79, 72, 80, 67, 83, 90, 93, 95, 91, 94, 98, 100, 80, 69, 85, 91, 91, 100, 100, 103, 98, 106, 100, 105, 106, 107, 107, 110, 94, 111] 0

k\_1000 32

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_2.sm case j12013\_2.sm

24 721.0683569908142 s [99, 174] 12.5 [0, 0, 0, 0, 10, 8, 10, 12, 27, 19, 45, 8, 11, 29, 10, 10, 20, 35, 11, 12, 25, 10, 14, 19, 35, 37, 20, 56, 68, 21, 48, 54, 11, 11, 17, 20, 14, 39, 58, 30, 24, 52, 44, 28, 45, 36, 17, 45, 39, 49, 17, 45, 75, 17, 53, 36, 46, 16, 25, 56, 53, 53, 29, 30, 62, 52, 68, 37, 63, 56, 73, 58, 17, 67, 79, 63, 63, 58, 28, 38, 38, 75, 45, 19, 30, 51, 51, 66, 44, 59, 70, 72, 48, 80, 83, 75, 84, 39, 50, 80, 69, 67, 46, 78, 78, 54, 75, 85, 80, 28, 87, 82, 75, 68, 84, 88, 90, 82, 91, 89, 94, 99] 0

k\_1000 33

opm 114

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_3.sm case j12013\_3.sm

15 718.6977322101593 s [132, 146] 15.789473684210526 [0, 0, 0, 0, 7, 17, 6, 1, 27, 34, 1, 7, 8, 13, 16, 16, 16, 19, 27, 8, 22, 8, 27, 17, 30, 31, 35, 9, 34, 35, 50, 23, 23, 45, 52, 53, 7, 44, 42, 41, 92, 60, 42, 50, 63, 44, 40, 13, 31, 31, 22, 53, 39, 56, 31, 76, 26, 53, 68, 13, 29, 78, 62, 63, 87, 53, 71, 39, 59, 100, 83, 87, 19, 67, 17, 61, 69, 56, 60, 84, 73, 63, 75, 78, 53, 68, 42, 53, 61, 67, 96, 57, 44, 73, 103, 71, 48, 110, 76, 84, 100, 87, 66, 88, 100, 44, 90, 103, 67, 90, 97, 105, 105, 109, 110, 111, 119, 113, 118, 122, 84, 132] 0

k\_1000 34

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_4.sm case j12013\_4.sm

20 733.38152551651 s [125, 151] 16.822429906542055 [0, 0, 0, 0, 10, 10, 16, 10, 18, 30, 16, 22, 8, 18, 37, 22, 16, 26, 22, 32, 37, 28, 26, 22, 32, 33, 18, 2, 18, 39, 50, 54, 41, 48, 54, 45, 39, 39, 45, 11, 34, 48, 59, 2, 20, 22, 50, 28, 43, 39, 23, 52, 58, 65, 54, 26, 30, 34, 59, 67, 63, 73, 57, 79, 63, 52, 82, 71, 57, 26, 74, 45, 86, 73, 68, 78, 37, 81, 32, 70, 5, 104, 30, 87, 83, 88, 95, 23, 52, 63, 69, 103, 104, 79, 82, 73, 83, 51, 91, 94, 101, 107, 96, 56, 101, 110, 73, 102, 93, 94, 103, 97, 110, 97, 103, 119, 112, 115, 122, 108, 119, 125] 0

k\_1000 35

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_5.sm case j12013\_5.sm

18 725.0391116142273 s [106, 269] 19.101123595505616 [0, 0, 0, 0, 10, 8, 12, 10, 19, 17, 17, 12, 15, 17, 31, 38, 24, 48, 10, 38, 21, 31, 26, 15, 24, 41, 8, 21, 21, 49, 28, 21, 19, 63, 31, 38, 31, 21, 32, 31, 27, 12, 18, 45, 38, 8, 36, 29, 27, 18, 48, 35, 21, 36, 43, 51, 53, 55, 33, 38, 31, 38, 50, 47, 12, 51, 51, 21, 78, 57, 54, 50, 57, 57, 60, 43, 53, 38, 51, 66, 52, 48, 56, 41, 60, 44, 55, 55, 31, 69, 72, 80, 70, 28, 41, 83, 69, 87, 62, 66, 67, 73, 81, 59, 59, 58, 62, 75, 80, 67, 83, 78, 73, 92, 90, 96, 85, 90, 100, 97, 99, 106] 0

k\_1000 36

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_6.sm case j12013\_6.sm

22 726.8551864624023 s [116, 349] 22.105263157894736 [0, 0, 0, 0, 9, 1, 5, 5, 15, 16, 12, 10, 15, 22, 28, 10, 5, 33, 18, 34, 9, 10, 12, 14, 17, 35, 44, 9, 19, 1, 20, 32, 40, 17, 23, 21, 30, 39, 35, 44, 47, 32, 51, 26, 47, 15, 40, 27, 17, 38, 51, 51, 23, 53, 57, 40, 16, 7, 61, 66, 38, 59, 55, 38, 16, 33, 48, 60, 28, 50, 48, 54, 26, 53, 59, 63, 64, 63, 61, 70, 69, 19, 70, 42, 67, 27, 74, 72, 78, 63, 76, 69, 87, 80, 72, 80, 76, 72, 83, 83, 77, 86, 85, 85, 90, 87, 86, 90, 78, 93, 86, 88, 95, 95, 99, 101, 101, 89, 99, 99, 106, 116] 0

k\_1000 37

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_7.sm case j12013\_7.sm

19 756.8314383029938 s [125, 137] 16.822429906542055 [0, 0, 0, 0, 4, 4, 11, 3, 20, 4, 21, 3, 14, 22, 4, 4, 21, 6, 20, 7, 22, 32, 13, 29, 11, 39, 7, 27, 22, 26, 35, 41, 46, 23, 46, 8, 36, 12, 31, 36, 55, 27, 27, 66, 51, 60, 39, 25, 25, 48, 66, 77, 17, 23, 75, 27, 54, 80, 67, 72, 65, 64, 56, 46, 51, 48, 93, 57, 77, 75, 76, 85, 85, 64, 41, 75, 91, 69, 11, 69, 49, 14, 85, 77, 85, 74, 85, 87, 6, 95, 67, 41, 93, 33, 35, 73, 93, 39, 93, 51, 77, 97, 30, 85, 88, 94, 99, 94, 101, 78, 28, 108, 111, 103, 104, 97, 116, 111, 121, 118, 117, 125] 0

k\_1000 38

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_8.sm case j12013\_8.sm

22 730.1398003101349 s [112, 112] 24.444444444444443 [0, 0, 0, 0, 1, 15, 2, 2, 1, 2, 6, 6, 13, 49, 8, 19, 7, 13, 37, 24, 1, 20, 23, 2, 62, 18, 7, 16, 16, 18, 46, 24, 25, 5, 34, 62, 24, 55, 14, 12, 23, 33, 44, 69, 28, 23, 50, 14, 16, 38, 29, 69, 28, 41, 34, 13, 31, 54, 27, 36, 63, 59, 34, 49, 15, 46, 50, 31, 20, 24, 55, 56, 67, 14, 55, 17, 44, 59, 15, 52, 31, 74, 37, 72, 44, 59, 38, 85, 67, 76, 61, 59, 41, 23, 67, 76, 69, 61, 80, 87, 71, 79, 90, 80, 92, 91, 84, 79, 83, 84, 92, 96, 95, 76, 93, 90, 101, 94, 102, 106, 93, 112] 0

k\_1000 39

opm 82

the random choice case path in j120 ./rcpsp/j120.sm/j12013\_9.sm case j12013\_9.sm

24 693.2879049777985 s [97, 147] 18.29268292682927 [0, 0, 0, 0, 4, 4, 6, 4, 25, 10, 5, 27, 16, 14, 4, 5, 17, 33, 27, 11, 18, 8, 12, 20, 36, 16, 20, 18, 5, 36, 50, 33, 6, 16, 16, 46, 43, 51, 25, 25, 38, 33, 18, 17, 38, 18, 39, 24, 17, 49, 58, 49, 19, 39, 42, 6, 53, 60, 26, 12, 51, 26, 52, 17, 41, 44, 22, 52, 52, 30, 42, 61, 39, 23, 39, 46, 68, 49, 40, 46, 43, 50, 67, 39, 68, 56, 56, 17, 54, 61, 55, 66, 70, 58, 67, 42, 61, 59, 71, 68, 59, 62, 71, 60, 30, 79, 61, 70, 70, 71, 73, 87, 73, 80, 81, 88, 91, 76, 95, 85, 83, 97] 0

k\_1000 40

opm 84

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_1.sm case j12014\_1.sm

21 671.5614659786224 s [100, 109] 19.047619047619047 [0, 0, 0, 0, 8, 8, 8, 8, 8, 3, 13, 14, 24, 13, 17, 13, 13, 19, 3, 14, 22, 46, 32, 15, 28, 23, 5, 28, 54, 5, 18, 36, 58, 37, 19, 39, 36, 26, 32, 26, 37, 43, 32, 13, 37, 17, 37, 3, 14, 14, 43, 45, 28, 50, 30, 66, 28, 61, 45, 47, 22, 18, 18, 22, 47, 13, 39, 32, 30, 56, 46, 53, 28, 25, 47, 55, 18, 61, 48, 61, 66, 54, 54, 76, 65, 73, 57, 66, 28, 61, 68, 71, 58, 52, 59, 66, 36, 76, 68, 65, 58, 65, 75, 68, 78, 63, 46, 78, 55, 48, 73, 82, 65, 78, 81, 76, 70, 88, 86, 95, 88, 100] 0

k\_1000 41

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_10.sm case j12014\_10.sm

29 726.4483320713043 s [89, 134] 11.25 [0, 0, 0, 0, 6, 3, 6, 11, 7, 14, 11, 17, 13, 16, 44, 20, 17, 31, 7, 16, 11, 17, 22, 22, 20, 24, 24, 7, 6, 25, 34, 38, 26, 38, 38, 44, 53, 38, 34, 24, 17, 41, 10, 3, 10, 16, 10, 15, 31, 49, 53, 48, 41, 35, 38, 13, 43, 50, 46, 34, 58, 25, 46, 27, 15, 30, 41, 46, 19, 41, 56, 49, 39, 25, 49, 39, 43, 22, 27, 44, 48, 38, 63, 63, 57, 56, 70, 62, 67, 22, 63, 53, 48, 47, 70, 62, 69, 66, 67, 57, 44, 64, 52, 77, 51, 18, 48, 77, 58, 62, 52, 79, 68, 24, 68, 78, 77, 80, 80, 79, 81, 89] 0

k\_1000 42

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_2.sm case j12014\_2.sm

24 720.2409949302673 s [104, 127] 16.853932584269664 [0, 0, 0, 0, 2, 2, 10, 11, 5, 11, 19, 21, 19, 22, 11, 29, 30, 22, 23, 25, 5, 40, 32, 26, 22, 4, 23, 23, 33, 12, 14, 33, 28, 40, 36, 36, 29, 23, 43, 44, 41, 46, 53, 16, 53, 50, 59, 37, 48, 21, 2, 61, 23, 50, 37, 47, 12, 57, 65, 75, 33, 34, 54, 33, 14, 38, 46, 4, 5, 69, 56, 45, 23, 67, 26, 29, 47, 13, 48, 58, 47, 62, 67, 59, 40, 67, 46, 68, 16, 38, 69, 56, 57, 65, 75, 76, 79, 53, 69, 74, 41, 80, 60, 86, 62, 63, 70, 68, 69, 78, 86, 88, 79, 84, 79, 84, 94, 92, 96, 95, 84, 104] 0

k\_1000 43

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_3.sm case j12014\_3.sm

29 704.3554527759552 s [97, 103] 10.227272727272728 [0, 0, 0, 0, 7, 16, 7, 17, 2, 10, 13, 7, 13, 20, 18, 10, 10, 8, 16, 22, 2, 8, 22, 24, 20, 37, 14, 2, 26, 8, 25, 17, 32, 27, 13, 26, 19, 35, 17, 11, 33, 17, 18, 40, 13, 42, 30, 11, 27, 34, 28, 54, 30, 14, 39, 22, 18, 61, 13, 48, 52, 28, 8, 41, 32, 30, 14, 24, 22, 45, 48, 39, 41, 56, 58, 59, 47, 32, 61, 71, 27, 40, 42, 35, 43, 55, 69, 51, 29, 50, 63, 52, 45, 59, 68, 70, 61, 74, 68, 67, 52, 67, 75, 70, 16, 77, 77, 69, 55, 78, 55, 81, 81, 80, 82, 87, 87, 84, 96, 79, 87, 97] 0

k\_1000 44

opm 85

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_4.sm case j12014\_4.sm

19 695.5129256248474 s [105, 111] 23.52941176470588 [0, 0, 0, 7, 6, 4, 1, 4, 1, 7, 13, 17, 8, 7, 17, 5, 4, 31, 23, 7, 31, 13, 18, 18, 18, 30, 22, 17, 19, 5, 7, 53, 25, 40, 24, 13, 31, 18, 25, 31, 43, 47, 37, 17, 24, 1, 71, 62, 35, 17, 8, 19, 47, 11, 17, 32, 30, 55, 42, 63, 31, 56, 56, 64, 39, 35, 41, 21, 41, 64, 50, 7, 66, 19, 69, 47, 63, 66, 24, 38, 57, 42, 63, 69, 54, 47, 55, 34, 60, 71, 50, 41, 73, 70, 71, 80, 71, 32, 78, 75, 70, 81, 86, 63, 72, 88, 32, 23, 81, 77, 77, 89, 82, 87, 84, 79, 95, 89, 96, 97, 78, 105] 0

k\_1000 45

opm 93

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_5.sm case j12014\_5.sm

18 738.7695014476776 s [113, 125] 21.50537634408602 [0, 0, 0, 0, 3, 4, 4, 5, 9, 5, 11, 14, 45, 24, 29, 1, 24, 1, 59, 1, 5, 32, 63, 3, 12, 5, 38, 32, 21, 6, 41, 6, 10, 61, 37, 19, 28, 10, 24, 16, 51, 16, 51, 61, 36, 78, 71, 45, 41, 51, 8, 29, 52, 19, 41, 12, 29, 11, 60, 33, 38, 22, 69, 55, 22, 62, 37, 22, 52, 53, 83, 14, 51, 62, 45, 39, 40, 49, 50, 28, 52, 69, 10, 91, 50, 53, 56, 59, 69, 83, 41, 86, 52, 70, 80, 56, 95, 62, 90, 79, 71, 83, 33, 70, 59, 87, 79, 62, 76, 83, 90, 63, 91, 80, 83, 92, 99, 99, 104, 94, 108, 113] 0

k\_1000 46

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_6.sm case j12014\_6.sm

22 737.2028517723083 s [99, 212] 8.791208791208792 [0, 0, 0, 0, 3, 1, 8, 1, 7, 7, 7, 8, 13, 27, 8, 10, 9, 8, 10, 19, 17, 14, 1, 14, 18, 23, 13, 29, 13, 14, 21, 19, 31, 18, 10, 27, 30, 21, 3, 29, 34, 2, 18, 16, 29, 21, 38, 23, 35, 22, 19, 29, 38, 30, 44, 30, 24, 54, 26, 19, 30, 40, 35, 45, 21, 37, 47, 47, 39, 36, 18, 47, 54, 53, 40, 54, 55, 48, 59, 29, 30, 38, 50, 50, 2, 45, 55, 30, 59, 62, 62, 66, 62, 68, 47, 37, 59, 72, 69, 68, 74, 74, 48, 74, 56, 76, 76, 79, 82, 61, 79, 81, 72, 82, 82, 92, 69, 89, 85, 97, 75, 99] 0

k\_1000 47

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_7.sm case j12014\_7.sm

27 724.9892880916595 s [96, 135] 7.865168539325842 [0, 0, 0, 0, 1, 14, 8, 4, 1, 11, 14, 27, 20, 22, 24, 4, 8, 9, 9, 20, 49, 21, 15, 30, 51, 4, 11, 19, 11, 24, 14, 15, 40, 8, 27, 23, 8, 49, 38, 18, 27, 32, 18, 40, 24, 17, 33, 48, 40, 28, 8, 55, 58, 17, 39, 24, 40, 33, 38, 45, 29, 19, 18, 58, 25, 51, 20, 49, 45, 10, 32, 49, 16, 22, 48, 25, 30, 50, 33, 59, 51, 39, 61, 20, 48, 40, 59, 57, 57, 30, 18, 1, 38, 46, 64, 54, 55, 64, 55, 62, 64, 64, 63, 61, 57, 60, 66, 66, 65, 65, 70, 67, 70, 73, 79, 76, 65, 76, 81, 69, 86, 96] 0

k\_1000 48

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_8.sm case j12014\_8.sm

20 748.320024728775 s [123, 134] 13.88888888888889 [0, 0, 0, 0, 8, 16, 7, 16, 26, 24, 36, 44, 44, 24, 31, 35, 48, 37, 46, 48, 39, 16, 39, 57, 10, 4, 40, 10, 35, 57, 19, 17, 5, 49, 59, 43, 14, 66, 53, 46, 67, 37, 46, 73, 24, 39, 55, 7, 74, 72, 74, 55, 56, 43, 73, 88, 84, 9, 35, 66, 60, 73, 4, 48, 83, 80, 94, 80, 26, 63, 14, 64, 89, 17, 55, 59, 26, 17, 67, 60, 56, 67, 84, 91, 54, 40, 91, 44, 54, 82, 80, 93, 70, 59, 87, 75, 93, 39, 103, 88, 93, 100, 100, 105, 88, 100, 77, 94, 33, 24, 103, 100, 93, 104, 92, 111, 93, 102, 109, 109, 114, 123] 0

k\_1000 49

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12014\_9.sm case j12014\_9.sm

26 694.6090288162231 s [104, 129] 2.9702970297029703 [0, 0, 0, 0, 6, 13, 13, 18, 18, 23, 6, 30, 1, 23, 26, 23, 23, 30, 23, 40, 16, 3, 11, 46, 48, 25, 26, 30, 22, 52, 1, 19, 28, 41, 63, 52, 18, 66, 33, 50, 31, 18, 49, 55, 55, 19, 21, 56, 32, 56, 61, 31, 66, 25, 66, 3, 34, 32, 34, 41, 61, 71, 59, 65, 34, 40, 55, 59, 34, 66, 63, 68, 56, 73, 56, 69, 37, 40, 74, 13, 75, 81, 66, 80, 56, 26, 65, 21, 73, 43, 56, 12, 49, 80, 81, 87, 86, 75, 48, 56, 86, 79, 85, 73, 66, 66, 78, 68, 94, 88, 82, 87, 88, 75, 85, 88, 82, 96, 97, 93, 103, 104] 0

k\_1000 50

opm 81

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_1.sm case j12015\_1.sm

21 436.48396253585815 s [81, 81] 0.0 [0, 0, 0, 0, 1, 1, 2, 12, 5, 12, 2, 10, 8, 10, 10, 13, 7, 13, 21, 7, 21, 17, 7, 1, 8, 12, 12, 17, 17, 21, 8, 18, 25, 26, 17, 18, 26, 21, 15, 16, 26, 32, 21, 9, 15, 5, 20, 23, 22, 33, 5, 29, 20, 26, 25, 31, 28, 34, 35, 9, 19, 44, 34, 26, 30, 40, 27, 9, 29, 41, 36, 48, 40, 27, 36, 19, 53, 29, 36, 41, 35, 50, 36, 45, 34, 44, 40, 44, 48, 54, 37, 60, 44, 9, 53, 56, 61, 53, 13, 54, 27, 66, 48, 44, 44, 51, 52, 67, 54, 58, 58, 66, 70, 53, 63, 63, 70, 50, 60, 78, 65, 81] 0

k\_1000 51

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_10.sm case j12015\_10.sm

30 710.2342276573181 s [97, 103] 6.593406593406594 [0, 0, 0, 0, 4, 4, 10, 6, 16, 6, 38, 6, 4, 7, 10, 16, 6, 20, 10, 11, 28, 11, 10, 16, 18, 6, 11, 16, 40, 16, 27, 20, 36, 11, 31, 41, 24, 24, 45, 11, 42, 26, 48, 41, 19, 11, 23, 32, 28, 29, 24, 34, 35, 37, 10, 41, 26, 24, 20, 36, 54, 41, 25, 52, 30, 31, 37, 24, 24, 26, 41, 36, 29, 42, 36, 46, 35, 36, 32, 47, 56, 41, 27, 46, 54, 49, 57, 44, 42, 63, 47, 57, 21, 45, 55, 38, 57, 54, 53, 60, 56, 67, 63, 42, 65, 60, 48, 61, 77, 69, 57, 53, 68, 69, 78, 73, 71, 87, 86, 91, 77, 97] 0

k\_1000 52

opm 75

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_2.sm case j12015\_2.sm

35 715.6150012016296 s [83, 97] 10.666666666666668 [0, 0, 0, 0, 9, 12, 12, 12, 9, 14, 14, 8, 9, 19, 14, 24, 19, 8, 21, 13, 20, 12, 13, 29, 20, 14, 29, 15, 37, 21, 19, 42, 22, 10, 29, 15, 13, 22, 32, 22, 29, 19, 38, 26, 27, 34, 23, 32, 22, 34, 20, 34, 27, 24, 43, 40, 41, 41, 26, 32, 37, 19, 39, 41, 49, 31, 42, 28, 50, 35, 22, 35, 24, 45, 43, 41, 19, 49, 48, 44, 43, 42, 33, 50, 50, 52, 51, 31, 36, 31, 38, 60, 53, 55, 23, 63, 45, 44, 53, 60, 68, 59, 57, 46, 54, 43, 48, 62, 55, 54, 52, 53, 24, 64, 69, 57, 67, 71, 70, 76, 78, 83] 0

k\_1000 53

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_3.sm case j12015\_3.sm

35 717.4134571552277 s [91, 116] 4.597701149425287 [0, 0, 0, 0, 4, 5, 6, 4, 7, 10, 12, 12, 12, 18, 27, 16, 1, 1, 8, 4, 6, 8, 13, 15, 21, 14, 4, 31, 24, 28, 32, 18, 6, 18, 22, 30, 23, 30, 4, 28, 17, 31, 54, 33, 55, 19, 33, 38, 24, 49, 13, 35, 24, 23, 14, 36, 11, 14, 42, 31, 27, 31, 15, 48, 1, 37, 21, 35, 46, 14, 51, 40, 31, 28, 48, 42, 30, 32, 35, 45, 26, 35, 65, 52, 40, 55, 66, 29, 43, 55, 39, 43, 57, 41, 62, 23, 60, 42, 64, 66, 42, 48, 53, 67, 59, 46, 49, 73, 51, 76, 41, 29, 58, 74, 45, 77, 67, 76, 77, 54, 82, 91] 0

k\_1000 54

opm 82

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_4.sm case j12015\_4.sm

46 710.0020778179169 s [84, 89] 2.4390243902439024 [0, 0, 0, 0, 8, 2, 11, 2, 4, 2, 5, 11, 4, 20, 21, 9, 8, 18, 30, 26, 11, 26, 12, 14, 14, 8, 5, 26, 12, 5, 16, 13, 16, 30, 20, 18, 23, 19, 4, 21, 33, 16, 26, 6, 7, 13, 23, 38, 30, 35, 35, 7, 26, 39, 38, 6, 24, 41, 45, 31, 21, 45, 30, 11, 19, 27, 19, 39, 43, 43, 21, 18, 23, 30, 35, 21, 36, 30, 48, 25, 36, 50, 41, 18, 38, 57, 45, 39, 36, 49, 40, 27, 48, 47, 55, 47, 28, 24, 59, 31, 45, 40, 24, 39, 40, 53, 30, 50, 52, 64, 56, 56, 54, 62, 72, 47, 63, 66, 75, 67, 72, 84] 0

k\_1000 55

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_5.sm case j12015\_5.sm

7 84.79305839538574 s [87, 164] 0.0 [0, 0, 0, 0, 3, 3, 2, 17, 2, 3, 5, 5, 23, 3, 15, 3, 5, 6, 7, 10, 3, 10, 12, 7, 35, 2, 21, 22, 10, 11, 11, 7, 13, 5, 10, 10, 18, 18, 30, 25, 12, 18, 23, 33, 10, 21, 27, 24, 41, 34, 6, 16, 18, 15, 34, 38, 11, 31, 40, 38, 19, 36, 47, 16, 9, 11, 39, 31, 23, 34, 21, 26, 19, 24, 47, 27, 18, 8, 34, 31, 26, 16, 39, 35, 11, 47, 42, 30, 48, 43, 45, 47, 53, 54, 47, 56, 44, 57, 57, 44, 49, 19, 50, 48, 60, 33, 52, 57, 64, 71, 37, 48, 56, 69, 56, 77, 59, 56, 22, 76, 80, 87] 0

k\_1000 56

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_6.sm case j12015\_6.sm

13 169.83160734176636 s [97, 99] 0.0 [0, 0, 0, 0, 10, 10, 2, 4, 4, 14, 15, 2, 3, 15, 25, 20, 34, 21, 42, 15, 29, 20, 23, 10, 4, 2, 27, 10, 14, 47, 32, 30, 42, 10, 34, 27, 24, 43, 23, 32, 22, 14, 21, 3, 38, 11, 31, 23, 14, 12, 29, 31, 16, 34, 12, 38, 22, 33, 35, 26, 43, 42, 39, 44, 22, 47, 46, 29, 8, 47, 35, 48, 56, 52, 44, 47, 48, 38, 57, 35, 53, 39, 48, 56, 54, 48, 57, 60, 29, 69, 41, 47, 50, 57, 65, 29, 63, 73, 25, 71, 50, 58, 71, 74, 59, 60, 74, 67, 68, 78, 79, 66, 80, 42, 88, 50, 33, 89, 94, 76, 85, 97] 0

k\_1000 57

opm 75

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_7.sm case j12015\_7.sm

12 156.3172996044159 s [75, 130] 0.0 [0, 0, 0, 0, 1, 5, 1, 5, 11, 19, 8, 7, 23, 15, 7, 20, 27, 29, 11, 5, 28, 1, 13, 19, 19, 14, 15, 23, 22, 18, 5, 23, 17, 5, 22, 17, 5, 26, 17, 25, 9, 20, 28, 25, 11, 23, 22, 17, 11, 7, 28, 27, 11, 9, 34, 17, 33, 29, 37, 18, 16, 25, 26, 6, 25, 26, 35, 35, 35, 42, 29, 37, 30, 38, 35, 38, 42, 11, 22, 25, 46, 26, 17, 38, 20, 15, 47, 52, 42, 10, 33, 29, 35, 26, 35, 51, 42, 45, 45, 56, 43, 41, 51, 46, 59, 52, 54, 43, 53, 55, 45, 48, 52, 53, 56, 67, 63, 46, 69, 63, 54, 75] 0

k\_1000 58

opm 126

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_8.sm case j12015\_8.sm

0 17.737478494644165 s [126, 126] 0.0 [0, 0, 0, 0, 2, 2, 2, 10, 7, 10, 10, 14, 7, 15, 15, 3, 5, 25, 20, 15, 10, 33, 43, 12, 10, 10, 29, 18, 12, 32, 34, 20, 8, 18, 13, 28, 14, 35, 18, 39, 20, 17, 9, 14, 22, 29, 33, 25, 18, 3, 41, 49, 13, 30, 20, 27, 27, 39, 44, 50, 43, 30, 48, 3, 28, 37, 20, 48, 14, 8, 31, 39, 52, 18, 33, 44, 38, 33, 55, 19, 59, 26, 37, 50, 42, 60, 39, 24, 47, 50, 28, 53, 57, 23, 38, 25, 27, 60, 69, 45, 61, 49, 45, 69, 61, 49, 69, 76, 77, 85, 95, 60, 61, 98, 108, 85, 118, 72, 68, 69, 120, 126] 0

k\_1000 59

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j12015\_9.sm case j12015\_9.sm

0 7.250577211380005 s [109, 127] 0.0 [0, 0, 0, 0, 7, 2, 7, 13, 2, 21, 28, 7, 14, 37, 12, 23, 33, 51, 15, 13, 23, 32, 14, 24, 12, 37, 40, 14, 2, 12, 7, 28, 24, 33, 7, 36, 14, 46, 36, 37, 19, 42, 34, 21, 42, 59, 58, 52, 44, 17, 33, 24, 40, 45, 62, 60, 67, 53, 41, 33, 31, 46, 24, 34, 58, 41, 16, 35, 14, 50, 52, 43, 31, 30, 76, 46, 49, 67, 50, 60, 60, 21, 19, 68, 29, 58, 55, 51, 55, 60, 37, 41, 76, 66, 43, 58, 53, 53, 46, 50, 76, 77, 55, 74, 67, 77, 85, 21, 43, 62, 68, 67, 81, 80, 90, 62, 95, 87, 70, 101, 75, 109] 0

k\_1000 60

opm 179

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_1.sm case j12016\_1.sm

11 1596.565370798111 s [221, 263] 23.463687150837988 [0, 0, 0, 0, 1, 2, 22, 10, 27, 10, 15, 10, 37, 29, 19, 15, 9, 14, 42, 47, 64, 50, 69, 11, 70, 4, 45, 80, 25, 73, 96, 14, 7, 59, 29, 73, 53, 65, 89, 130, 35, 80, 35, 20, 116, 49, 69, 70, 136, 136, 50, 76, 130, 108, 84, 91, 154, 48, 74, 47, 108, 76, 143, 99, 143, 61, 145, 115, 92, 161, 22, 124, 104, 135, 131, 147, 81, 94, 61, 164, 124, 168, 168, 180, 145, 91, 188, 174, 94, 178, 174, 56, 103, 164, 174, 115, 125, 185, 197, 197, 74, 189, 156, 135, 156, 180, 195, 190, 205, 206, 205, 199, 180, 213, 187, 191, 215, 214, 218, 210, 215, 221] 0

k\_1000 61

opm 202

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_10.sm case j12016\_10.sm

11 2121.043781042099 s [246, 338] 21.782178217821784 [0, 0, 0, 0, 17, 17, 20, 30, 30, 1, 62, 52, 59, 43, 75, 51, 59, 89, 83, 33, 37, 94, 33, 1, 105, 75, 123, 68, 115, 8, 130, 76, 90, 109, 45, 11, 99, 121, 103, 140, 112, 27, 155, 174, 114, 12, 158, 187, 82, 115, 127, 124, 154, 59, 131, 145, 68, 82, 138, 161, 138, 156, 170, 133, 59, 99, 121, 43, 12, 20, 149, 171, 10, 35, 195, 154, 25, 51, 170, 180, 142, 90, 15, 202, 67, 210, 195, 190, 85, 147, 63, 180, 103, 149, 135, 96, 173, 164, 184, 184, 167, 122, 220, 202, 232, 217, 233, 211, 211, 220, 229, 184, 197, 231, 220, 230, 236, 232, 235, 236, 237, 246] 0

k\_1000 62

opm 218

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_2.sm case j12016\_2.sm

11 2703.407019138336 s [269, 542] 23.394495412844037 [0, 0, 0, 0, 2, 6, 35, 72, 19, 41, 19, 14, 7, 41, 25, 19, 10, 14, 46, 2, 26, 16, 4, 35, 46, 80, 53, 70, 94, 96, 132, 24, 61, 47, 120, 37, 61, 98, 105, 89, 106, 101, 38, 157, 85, 169, 103, 113, 141, 54, 125, 40, 128, 80, 151, 70, 57, 159, 98, 65, 113, 81, 47, 92, 11, 151, 173, 113, 123, 165, 56, 147, 33, 137, 178, 75, 54, 132, 164, 204, 106, 129, 178, 66, 191, 160, 211, 177, 142, 143, 186, 201, 183, 196, 191, 209, 224, 196, 211, 204, 221, 184, 165, 216, 228, 216, 225, 233, 221, 246, 233, 219, 235, 219, 237, 245, 243, 250, 255, 255, 265, 269] 0

k\_1000 63

opm 219

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_3.sm case j12016\_3.sm

11 2737.9355261325836 s [258, 2128] 17.80821917808219 [0, 0, 0, 0, 9, 36, 9, 12, 18, 37, 18, 19, 56, 47, 29, 28, 89, 71, 19, 92, 50, 106, 92, 47, 16, 97, 99, 84, 53, 61, 105, 78, 18, 34, 74, 113, 79, 79, 56, 86, 116, 88, 42, 93, 63, 119, 28, 23, 119, 103, 102, 71, 89, 24, 143, 128, 36, 136, 150, 65, 119, 128, 101, 123, 159, 144, 72, 63, 152, 135, 65, 119, 104, 24, 170, 152, 126, 174, 181, 168, 161, 128, 178, 186, 87, 204, 200, 208, 219, 183, 106, 181, 216, 204, 236, 218, 190, 241, 168, 173, 193, 167, 193, 69, 213, 176, 229, 194, 235, 232, 204, 213, 225, 186, 221, 245, 236, 242, 246, 255, 235, 258] 0

k\_1000 64

opm 189

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_4.sm case j12016\_4.sm

11 2413.135730266571 s [227, 1084] 20.105820105820104 [0, 0, 0, 23, 9, 2, 9, 12, 43, 15, 30, 12, 77, 16, 41, 14, 93, 14, 13, 24, 2, 63, 39, 60, 27, 73, 68, 39, 17, 47, 61, 65, 54, 84, 74, 32, 73, 47, 83, 102, 50, 37, 54, 38, 70, 31, 24, 74, 68, 99, 87, 62, 90, 112, 77, 74, 93, 61, 120, 57, 123, 82, 129, 132, 112, 147, 138, 120, 138, 99, 65, 139, 142, 132, 129, 8, 105, 160, 109, 61, 112, 169, 185, 160, 78, 161, 170, 180, 123, 57, 179, 90, 161, 105, 170, 130, 153, 115, 147, 148, 187, 155, 201, 185, 152, 155, 168, 187, 190, 193, 119, 205, 176, 208, 209, 208, 218, 196, 216, 226, 179, 227] 0

k\_1000 65

opm 184

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_5.sm case j12016\_5.sm

11 2227.37828707695 s [231, 298] 25.543478260869566 [0, 0, 0, 7, 87, 96, 9, 16, 13, 16, 154, 15, 72, 20, 110, 101, 55, 24, 24, 57, 78, 30, 51, 9, 21, 16, 23, 18, 42, 40, 32, 87, 18, 130, 150, 49, 32, 43, 127, 54, 125, 24, 45, 78, 161, 93, 65, 51, 128, 101, 117, 144, 57, 152, 136, 74, 32, 37, 121, 120, 130, 136, 65, 68, 61, 49, 92, 78, 135, 130, 88, 87, 139, 158, 144, 139, 186, 155, 158, 193, 167, 69, 111, 126, 94, 91, 118, 181, 101, 171, 149, 158, 116, 144, 88, 171, 118, 127, 167, 187, 165, 189, 183, 127, 175, 157, 196, 114, 104, 179, 201, 150, 193, 200, 206, 208, 216, 187, 222, 201, 195, 231] 0

k\_1000 66

opm 194

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_6.sm case j12016\_6.sm

11 2760.3558809757233 s [240, 776] 23.711340206185564 [0, 0, 16, 0, 23, 27, 2, 23, 24, 63, 27, 60, 29, 3, 50, 38, 46, 18, 76, 30, 32, 72, 45, 68, 91, 60, 81, 106, 59, 86, 3, 80, 116, 97, 89, 7, 5, 8, 126, 95, 133, 42, 32, 8, 68, 69, 6, 101, 50, 7, 96, 142, 98, 18, 106, 84, 83, 144, 154, 38, 52, 52, 96, 18, 98, 112, 94, 135, 48, 161, 64, 53, 72, 154, 121, 143, 116, 103, 115, 126, 168, 71, 168, 121, 140, 135, 145, 171, 163, 153, 187, 163, 183, 140, 197, 180, 177, 198, 153, 189, 89, 181, 158, 206, 209, 128, 208, 203, 212, 177, 191, 221, 212, 220, 208, 121, 197, 221, 229, 203, 230, 240] 0

k\_1000 67

opm 174

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_7.sm case j12016\_7.sm

11 2066.0884730815887 s [209, 484] 20.114942528735632 [0, 0, 0, 0, 4, 5, 10, 8, 41, 8, 15, 25, 10, 46, 30, 12, 40, 16, 10, 83, 23, 92, 55, 56, 61, 61, 15, 102, 35, 56, 51, 25, 83, 52, 92, 56, 42, 34, 113, 91, 68, 107, 116, 47, 46, 79, 121, 121, 111, 120, 42, 100, 66, 144, 92, 109, 49, 59, 41, 72, 134, 130, 136, 140, 111, 144, 148, 100, 139, 109, 161, 156, 156, 113, 129, 137, 129, 101, 91, 154, 160, 105, 92, 128, 25, 77, 121, 155, 107, 166, 183, 163, 142, 133, 146, 166, 148, 193, 176, 170, 133, 173, 189, 137, 70, 203, 72, 176, 201, 192, 184, 180, 186, 196, 135, 193, 180, 185, 203, 198, 208, 209] 0

k\_1000 68

opm 182

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_8.sm case j12016\_8.sm

11 4136.630740880966 s [218, 972] 19.78021978021978 [0, 0, 0, 0, 9, 14, 2, 25, 32, 14, 76, 33, 23, 18, 57, 6, 27, 13, 34, 86, 28, 9, 62, 100, 64, 123, 100, 4, 30, 109, 10, 92, 118, 23, 38, 39, 69, 28, 86, 39, 28, 43, 54, 38, 71, 110, 34, 55, 152, 77, 148, 54, 109, 32, 103, 136, 91, 127, 148, 18, 160, 156, 130, 139, 148, 117, 152, 91, 58, 175, 64, 180, 166, 33, 81, 179, 100, 175, 142, 51, 181, 156, 47, 138, 152, 49, 113, 6, 172, 130, 75, 166, 75, 110, 113, 160, 192, 165, 184, 193, 193, 111, 181, 200, 203, 207, 130, 176, 102, 187, 192, 202, 195, 213, 183, 187, 199, 207, 213, 201, 216, 218] 0

k\_1000 69

opm 188

the random choice case path in j120 ./rcpsp/j120.sm/j12016\_9.sm case j12016\_9.sm

11 1697.9738545417786 s [239, 346] 27.127659574468083 [0, 0, 62, 0, 6, 69, 8, 11, 85, 12, 33, 56, 86, 13, 40, 72, 31, 12, 40, 37, 95, 29, 1, 22, 46, 105, 12, 48, 49, 77, 66, 93, 103, 106, 120, 121, 83, 53, 73, 18, 86, 22, 28, 132, 60, 69, 96, 31, 53, 103, 134, 53, 79, 131, 1, 43, 61, 48, 80, 69, 101, 110, 116, 123, 62, 76, 120, 171, 175, 185, 171, 131, 59, 172, 123, 44, 80, 190, 128, 105, 176, 113, 131, 147, 138, 147, 155, 154, 155, 199, 193, 164, 161, 172, 139, 72, 180, 181, 190, 151, 137, 147, 205, 201, 159, 200, 216, 197, 209, 217, 224, 231, 222, 201, 155, 222, 232, 214, 238, 234, 209, 239] 0

k\_1000 70

opm 135

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_1.sm case j12017\_1.sm

11 831.2626111507416 s [160, 897] 18.51851851851852 [0, 0, 0, 0, 11, 2, 6, 35, 6, 33, 7, 18, 23, 42, 2, 9, 26, 81, 32, 13, 45, 22, 49, 7, 35, 23, 18, 59, 13, 44, 42, 17, 60, 96, 29, 53, 50, 76, 79, 18, 9, 83, 26, 11, 10, 79, 81, 50, 36, 36, 50, 90, 65, 85, 83, 12, 72, 15, 46, 63, 91, 82, 48, 41, 36, 64, 64, 85, 103, 49, 53, 90, 71, 26, 66, 72, 103, 93, 77, 58, 76, 120, 104, 9, 71, 93, 111, 17, 63, 88, 116, 96, 104, 119, 112, 104, 100, 114, 93, 112, 130, 124, 120, 123, 132, 121, 132, 122, 127, 132, 136, 128, 138, 136, 142, 134, 139, 148, 136, 147, 150, 160] 0

k\_1000 71

opm 131

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_10.sm case j12017\_10.sm

11 1300.2001881599426 s [151, 261] 15.267175572519085 [0, 0, 0, 0, 7, 6, 14, 15, 10, 7, 62, 16, 31, 43, 24, 24, 26, 18, 18, 18, 6, 6, 24, 23, 19, 65, 34, 36, 18, 33, 75, 91, 39, 82, 28, 6, 70, 15, 81, 87, 78, 87, 68, 49, 112, 12, 97, 62, 50, 60, 63, 112, 107, 45, 45, 60, 54, 72, 74, 68, 97, 33, 28, 61, 42, 99, 52, 66, 108, 124, 90, 81, 117, 69, 66, 41, 74, 34, 108, 81, 48, 91, 111, 119, 90, 60, 100, 53, 88, 97, 112, 122, 102, 132, 57, 75, 140, 93, 117, 50, 74, 116, 123, 63, 107, 129, 131, 94, 137, 119, 104, 134, 144, 141, 147, 124, 132, 140, 150, 144, 149, 151] 0

k\_1000 72

opm 120

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_2.sm case j12017\_2.sm

11 795.874434709549 s [134, 306] 11.666666666666666 [0, 0, 5, 0, 1, 1, 1, 5, 10, 9, 13, 12, 5, 8, 40, 27, 28, 17, 35, 51, 49, 9, 60, 10, 22, 32, 15, 72, 34, 92, 35, 35, 16, 40, 56, 26, 65, 37, 51, 54, 40, 37, 15, 29, 2, 22, 83, 17, 56, 64, 28, 92, 84, 92, 55, 74, 78, 43, 44, 8, 84, 67, 20, 41, 11, 83, 8, 44, 60, 91, 43, 65, 62, 76, 61, 88, 63, 68, 25, 104, 74, 51, 74, 28, 26, 81, 94, 61, 97, 97, 64, 83, 83, 76, 100, 98, 90, 58, 97, 103, 99, 109, 96, 70, 110, 40, 110, 117, 110, 112, 102, 103, 108, 123, 117, 122, 120, 106, 122, 125, 127, 134] 0

k\_1000 73

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_3.sm case j12017\_3.sm

12 732.2928450107574 s [122, 642] 15.09433962264151 [0, 0, 0, 16, 8, 15, 1, 6, 6, 30, 14, 6, 2, 10, 1, 17, 30, 1, 61, 25, 47, 33, 15, 17, 21, 16, 25, 31, 9, 10, 39, 29, 2, 22, 16, 39, 39, 7, 42, 54, 47, 62, 11, 81, 44, 9, 33, 40, 91, 44, 14, 15, 25, 71, 74, 2, 24, 56, 46, 55, 25, 63, 34, 34, 74, 59, 100, 70, 53, 11, 92, 74, 53, 50, 55, 42, 78, 81, 78, 80, 55, 88, 38, 40, 53, 102, 47, 95, 65, 92, 68, 98, 30, 90, 95, 75, 73, 84, 109, 64, 86, 64, 93, 89, 96, 92, 97, 100, 81, 100, 107, 96, 97, 105, 106, 112, 107, 106, 119, 114, 112, 122] 0

k\_1000 74

opm 117

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_4.sm case j12017\_4.sm

13 745.268306016922 s [144, 149] 23.076923076923077 [0, 0, 0, 0, 5, 5, 5, 3, 8, 6, 35, 8, 42, 11, 15, 13, 64, 31, 17, 32, 44, 43, 19, 10, 46, 32, 10, 17, 44, 23, 54, 20, 28, 69, 19, 18, 74, 66, 23, 62, 70, 20, 74, 27, 85, 28, 59, 52, 28, 20, 58, 79, 50, 38, 22, 17, 38, 60, 71, 62, 33, 48, 13, 66, 35, 28, 80, 60, 64, 88, 84, 49, 23, 53, 76, 43, 46, 65, 47, 81, 72, 81, 85, 92, 75, 35, 97, 92, 94, 99, 84, 107, 68, 86, 111, 91, 90, 106, 98, 99, 99, 101, 114, 30, 108, 105, 110, 88, 94, 111, 113, 116, 116, 113, 125, 119, 135, 116, 137, 125, 137, 144] 0

k\_1000 75

opm 122

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_5.sm case j12017\_5.sm

11 973.4795234203339 s [153, 189] 25.40983606557377 [0, 0, 0, 0, 10, 31, 2, 2, 11, 6, 3, 17, 53, 7, 75, 12, 2, 40, 16, 19, 21, 26, 22, 21, 41, 47, 35, 19, 73, 19, 106, 57, 92, 11, 29, 53, 41, 12, 35, 28, 85, 18, 46, 56, 82, 104, 54, 92, 82, 30, 57, 32, 43, 47, 16, 82, 66, 107, 79, 22, 47, 94, 32, 94, 85, 98, 25, 65, 32, 67, 57, 80, 66, 95, 106, 93, 37, 89, 89, 113, 108, 61, 56, 116, 90, 116, 121, 16, 85, 129, 104, 57, 106, 73, 98, 118, 116, 43, 74, 74, 135, 70, 119, 142, 74, 127, 144, 127, 137, 132, 120, 120, 150, 101, 133, 129, 139, 133, 146, 125, 151, 153] 0

k\_1000 76

opm 133

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_6.sm case j12017\_6.sm

11 854.7870059013367 s [153, 163] 15.037593984962406 [0, 0, 0, 0, 2, 1, 28, 34, 22, 1, 13, 3, 13, 14, 3, 34, 8, 20, 51, 11, 23, 20, 11, 8, 20, 33, 44, 9, 30, 24, 23, 30, 17, 24, 63, 30, 20, 35, 44, 71, 41, 42, 11, 51, 35, 13, 19, 92, 63, 90, 37, 75, 24, 48, 57, 113, 65, 70, 84, 66, 100, 43, 78, 72, 86, 44, 80, 46, 79, 40, 70, 116, 53, 95, 46, 80, 122, 103, 44, 95, 126, 106, 80, 48, 104, 84, 39, 17, 97, 55, 100, 77, 112, 41, 113, 110, 47, 117, 119, 57, 61, 110, 90, 101, 124, 65, 135, 106, 119, 112, 49, 127, 137, 110, 138, 141, 127, 137, 130, 145, 148, 153] 0

k\_1000 77

opm 141

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_7.sm case j12017\_7.sm

11 947.4177961349487 s [163, 179] 15.602836879432624 [0, 0, 0, 0, 7, 5, 9, 11, 11, 25, 7, 7, 30, 7, 28, 40, 16, 21, 35, 35, 29, 13, 28, 9, 20, 87, 20, 77, 33, 12, 77, 56, 91, 45, 47, 47, 46, 67, 52, 41, 97, 83, 17, 32, 57, 5, 88, 67, 54, 33, 57, 108, 94, 81, 74, 106, 22, 46, 56, 63, 73, 81, 95, 98, 25, 100, 112, 64, 126, 135, 61, 10, 26, 68, 98, 110, 23, 50, 36, 96, 36, 51, 65, 74, 116, 82, 97, 110, 43, 118, 128, 129, 130, 133, 88, 92, 119, 41, 57, 109, 122, 61, 131, 143, 120, 124, 119, 133, 106, 141, 146, 143, 124, 145, 136, 143, 145, 144, 130, 154, 156, 163] 0

k\_1000 78

opm 126

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_8.sm case j12017\_8.sm

12 704.8992826938629 s [146, 151] 15.873015873015872 [0, 0, 0, 0, 14, 6, 16, 14, 6, 8, 17, 43, 18, 17, 64, 18, 10, 72, 24, 47, 25, 79, 51, 30, 55, 32, 43, 36, 17, 31, 72, 24, 48, 27, 54, 55, 38, 54, 40, 54, 79, 41, 28, 85, 40, 28, 33, 44, 87, 36, 30, 36, 85, 59, 79, 86, 86, 48, 41, 33, 64, 93, 55, 39, 41, 60, 69, 60, 72, 91, 88, 98, 51, 91, 62, 96, 69, 73, 64, 99, 103, 69, 106, 80, 98, 103, 83, 107, 101, 88, 103, 79, 70, 113, 110, 114, 113, 109, 117, 120, 124, 121, 113, 60, 117, 116, 123, 123, 98, 127, 119, 128, 130, 122, 131, 131, 125, 132, 136, 141, 137, 146] 0

k\_1000 79

opm 128

the random choice case path in j120 ./rcpsp/j120.sm/j12017\_9.sm case j12017\_9.sm

12 638.7732274532318 s [154, 180] 20.3125 [0, 0, 0, 0, 1, 3, 5, 5, 12, 21, 22, 1, 36, 21, 7, 43, 37, 62, 57, 11, 25, 36, 54, 18, 75, 9, 34, 45, 9, 44, 18, 58, 12, 69, 28, 3, 35, 28, 35, 4, 82, 49, 65, 94, 29, 34, 13, 43, 84, 102, 45, 108, 98, 63, 83, 28, 15, 109, 19, 78, 91, 71, 25, 73, 77, 78, 106, 65, 121, 53, 62, 121, 83, 89, 119, 95, 49, 52, 128, 70, 139, 96, 62, 103, 115, 92, 53, 79, 111, 92, 93, 128, 98, 86, 102, 104, 106, 107, 112, 66, 96, 129, 110, 117, 140, 111, 138, 122, 130, 75, 145, 116, 79, 143, 144, 144, 150, 139, 151, 148, 145, 154] 0

k\_1000 80

opm 137

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_1.sm case j12018\_1.sm

13 748.8808896541595 s [153, 158] 11.678832116788321 [0, 0, 0, 0, 22, 26, 2, 51, 9, 2, 26, 6, 32, 9, 16, 6, 18, 6, 66, 42, 35, 57, 62, 8, 21, 73, 8, 47, 49, 22, 60, 2, 35, 39, 14, 55, 12, 73, 60, 56, 93, 4, 39, 58, 42, 61, 68, 66, 77, 57, 60, 14, 93, 83, 84, 95, 22, 64, 70, 67, 42, 35, 64, 85, 18, 92, 35, 48, 104, 96, 93, 86, 87, 104, 108, 118, 90, 105, 25, 101, 64, 106, 114, 96, 87, 96, 113, 27, 111, 83, 109, 77, 102, 112, 121, 126, 123, 126, 125, 122, 106, 103, 128, 22, 128, 116, 131, 114, 122, 132, 97, 140, 135, 99, 144, 130, 142, 138, 150, 147, 144, 153] 0

k\_1000 81

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_10.sm case j12018\_10.sm

21 733.864762544632 s [114, 214] 18.75 [0, 0, 0, 0, 5, 5, 6, 5, 12, 52, 4, 15, 6, 40, 36, 18, 35, 20, 14, 18, 15, 28, 42, 27, 36, 20, 66, 6, 22, 41, 50, 19, 27, 16, 14, 14, 30, 49, 36, 54, 14, 4, 40, 33, 15, 46, 24, 67, 35, 27, 46, 36, 39, 74, 24, 60, 84, 63, 44, 39, 31, 75, 23, 49, 57, 35, 66, 52, 60, 33, 49, 46, 71, 60, 80, 67, 44, 43, 58, 52, 4, 56, 54, 24, 50, 65, 58, 50, 62, 79, 80, 70, 84, 88, 88, 41, 46, 43, 70, 64, 88, 64, 73, 71, 64, 80, 82, 70, 86, 87, 89, 94, 90, 90, 94, 101, 74, 94, 110, 95, 90, 114] 0

k\_1000 82

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_2.sm case j12018\_2.sm

15 682.5587358474731 s [135, 379] 21.62162162162162 [0, 0, 0, 0, 9, 9, 4, 9, 4, 19, 19, 26, 32, 4, 11, 28, 11, 11, 40, 18, 18, 31, 22, 40, 11, 18, 21, 50, 22, 24, 46, 29, 50, 44, 35, 31, 42, 51, 55, 19, 58, 44, 59, 59, 27, 59, 61, 21, 27, 36, 60, 73, 62, 26, 55, 40, 66, 46, 49, 29, 27, 53, 36, 71, 46, 61, 70, 68, 53, 81, 64, 66, 37, 63, 46, 86, 107, 56, 81, 81, 115, 100, 99, 49, 66, 63, 76, 59, 96, 81, 70, 83, 99, 89, 122, 76, 89, 88, 93, 84, 84, 84, 91, 88, 100, 100, 70, 69, 97, 100, 128, 108, 106, 109, 95, 109, 117, 116, 126, 130, 110, 135] 0

k\_1000 83

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_3.sm case j12018\_3.sm

15 701.4442706108093 s [110, 137] 10.0 [0, 0, 0, 0, 1, 12, 55, 7, 1, 3, 3, 7, 18, 27, 11, 11, 20, 9, 7, 11, 10, 46, 7, 18, 18, 8, 13, 13, 27, 34, 48, 31, 40, 42, 16, 44, 17, 1, 12, 20, 65, 28, 5, 37, 65, 5, 20, 16, 20, 23, 32, 40, 35, 61, 28, 35, 28, 28, 59, 56, 51, 50, 27, 66, 66, 50, 44, 57, 53, 31, 55, 74, 34, 56, 78, 64, 41, 35, 47, 40, 57, 84, 68, 75, 84, 84, 85, 79, 40, 89, 85, 61, 88, 70, 70, 64, 40, 74, 92, 76, 39, 48, 21, 73, 94, 89, 80, 92, 89, 58, 85, 68, 46, 98, 102, 74, 84, 93, 108, 102, 102, 110] 0

k\_1000 84

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_4.sm case j12018\_4.sm

20 717.4410257339478 s [116, 161] 18.367346938775512 [0, 0, 0, 0, 5, 2, 7, 7, 14, 21, 5, 5, 22, 17, 18, 11, 57, 34, 11, 2, 13, 17, 31, 7, 31, 16, 12, 13, 23, 40, 18, 22, 27, 19, 42, 26, 2, 15, 23, 40, 42, 19, 26, 30, 31, 51, 22, 44, 31, 52, 57, 60, 10, 40, 50, 64, 76, 27, 44, 52, 49, 57, 34, 27, 46, 66, 68, 57, 57, 53, 81, 68, 66, 44, 64, 71, 78, 58, 72, 79, 81, 82, 84, 90, 97, 42, 67, 67, 85, 61, 36, 49, 71, 70, 89, 65, 76, 85, 48, 34, 71, 84, 73, 37, 77, 78, 87, 90, 91, 94, 89, 103, 105, 94, 86, 96, 100, 111, 104, 112, 104, 116] 0

k\_1000 85

opm 117

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_5.sm case j12018\_5.sm

15 730.2676019668579 s [127, 172] 8.547008547008547 [0, 0, 0, 0, 7, 12, 18, 8, 9, 15, 7, 37, 30, 58, 40, 14, 19, 21, 29, 29, 9, 33, 9, 46, 29, 47, 46, 48, 22, 41, 6, 13, 33, 31, 59, 39, 53, 19, 46, 59, 43, 58, 54, 17, 49, 63, 33, 19, 52, 53, 41, 62, 15, 59, 24, 44, 76, 70, 83, 52, 70, 69, 59, 17, 94, 85, 78, 89, 92, 92, 97, 60, 70, 97, 70, 72, 87, 92, 25, 50, 70, 61, 96, 76, 73, 63, 86, 90, 101, 104, 105, 74, 82, 78, 106, 74, 62, 80, 105, 66, 100, 110, 83, 100, 80, 87, 89, 88, 102, 90, 115, 94, 106, 109, 33, 113, 111, 117, 91, 125, 123, 127] 0

k\_1000 86

opm 130

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_6.sm case j12018\_6.sm

15 757.0057060718536 s [144, 166] 10.76923076923077 [0, 0, 0, 0, 9, 7, 17, 9, 25, 28, 18, 17, 27, 15, 33, 49, 44, 9, 34, 16, 49, 57, 18, 14, 49, 31, 42, 31, 11, 14, 42, 56, 34, 59, 60, 64, 35, 52, 41, 26, 65, 79, 20, 55, 28, 67, 44, 68, 54, 77, 68, 70, 70, 17, 45, 49, 77, 59, 64, 70, 76, 80, 86, 45, 88, 88, 82, 52, 79, 73, 94, 96, 87, 97, 96, 102, 109, 94, 100, 34, 89, 97, 98, 76, 86, 89, 110, 104, 51, 106, 78, 93, 102, 119, 116, 55, 57, 100, 110, 89, 118, 109, 97, 116, 121, 125, 119, 118, 112, 119, 114, 123, 129, 133, 137, 105, 104, 118, 134, 132, 141, 144] 0

k\_1000 87

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_7.sm case j12018\_7.sm

14 683.4054729938507 s [137, 181] 23.423423423423422 [0, 0, 0, 0, 9, 7, 17, 11, 7, 11, 18, 17, 24, 18, 32, 57, 46, 24, 18, 26, 56, 7, 31, 36, 42, 26, 25, 39, 35, 24, 56, 86, 16, 49, 65, 45, 13, 69, 2, 70, 36, 65, 46, 41, 72, 85, 25, 36, 32, 21, 70, 60, 95, 54, 75, 82, 84, 47, 64, 17, 75, 81, 9, 94, 69, 52, 99, 9, 93, 23, 54, 82, 68, 106, 64, 31, 62, 52, 100, 93, 50, 55, 46, 75, 75, 109, 60, 78, 108, 78, 95, 102, 88, 93, 98, 105, 104, 74, 90, 91, 111, 78, 113, 122, 91, 77, 115, 97, 123, 111, 123, 109, 108, 114, 99, 131, 131, 123, 134, 133, 125, 137] 0

k\_1000 88

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_8.sm case j12018\_8.sm

18 721.2663505077362 s [118, 131] 16.831683168316832 [0, 0, 0, 0, 8, 18, 1, 1, 1, 6, 6, 6, 11, 13, 8, 15, 21, 27, 11, 18, 15, 28, 21, 28, 37, 13, 21, 19, 47, 29, 28, 15, 38, 29, 45, 38, 20, 20, 70, 75, 59, 31, 30, 31, 51, 18, 55, 22, 37, 54, 48, 77, 55, 60, 48, 50, 61, 39, 38, 84, 67, 52, 31, 53, 42, 23, 39, 59, 84, 52, 39, 49, 23, 67, 53, 84, 91, 51, 69, 94, 52, 75, 61, 88, 83, 41, 41, 26, 70, 31, 43, 69, 54, 70, 76, 78, 88, 70, 74, 76, 91, 96, 82, 96, 100, 103, 77, 98, 95, 98, 43, 99, 107, 106, 110, 90, 106, 108, 100, 111, 113, 118] 0

k\_1000 89

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j12018\_9.sm case j12018\_9.sm

19 683.5052292346954 s [102, 170] 15.909090909090908 [0, 0, 0, 0, 1, 8, 4, 14, 9, 4, 14, 4, 8, 24, 9, 17, 27, 9, 9, 15, 13, 17, 13, 42, 17, 12, 8, 13, 34, 8, 14, 17, 24, 15, 19, 26, 39, 29, 21, 28, 21, 33, 58, 27, 30, 41, 59, 32, 18, 36, 45, 52, 51, 34, 18, 40, 67, 58, 56, 57, 49, 60, 49, 44, 32, 33, 64, 52, 66, 41, 48, 45, 41, 56, 41, 60, 37, 51, 67, 48, 41, 73, 73, 67, 27, 77, 58, 85, 68, 49, 28, 36, 67, 33, 69, 24, 67, 61, 78, 41, 82, 74, 78, 79, 61, 86, 73, 81, 64, 87, 88, 61, 91, 88, 73, 93, 70, 94, 98, 82, 95, 102] 0

k\_1000 90

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_1.sm case j12019\_1.sm

28 741.2544248104095 s [99, 121] 12.5 [0, 0, 0, 0, 9, 11, 9, 6, 7, 7, 12, 12, 15, 13, 16, 24, 21, 15, 7, 10, 30, 15, 8, 25, 22, 43, 23, 29, 30, 6, 19, 21, 32, 6, 36, 19, 18, 33, 39, 17, 17, 49, 36, 8, 21, 41, 45, 15, 13, 23, 37, 25, 27, 14, 7, 17, 47, 31, 39, 26, 57, 60, 15, 56, 49, 59, 29, 33, 45, 53, 63, 63, 57, 55, 34, 62, 46, 40, 38, 41, 59, 38, 47, 47, 38, 67, 7, 53, 66, 63, 32, 39, 43, 67, 64, 44, 51, 30, 54, 60, 63, 65, 19, 74, 72, 48, 50, 65, 60, 72, 76, 48, 72, 41, 80, 81, 83, 84, 58, 56, 93, 99] 0

k\_1000 91

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_10.sm case j12019\_10.sm

24 724.2242739200592 s [95, 121] 7.954545454545454 [0, 0, 0, 0, 3, 12, 2, 14, 14, 2, 2, 19, 12, 3, 3, 21, 22, 12, 24, 21, 20, 11, 9, 24, 6, 3, 17, 28, 27, 9, 24, 9, 19, 25, 14, 12, 25, 8, 20, 40, 44, 14, 28, 31, 33, 20, 15, 44, 38, 25, 27, 54, 50, 34, 39, 46, 16, 53, 38, 46, 47, 41, 34, 48, 53, 43, 34, 41, 59, 30, 50, 50, 56, 49, 14, 56, 65, 44, 58, 53, 36, 30, 51, 54, 20, 43, 42, 68, 72, 29, 33, 63, 64, 57, 63, 64, 54, 71, 64, 50, 61, 64, 64, 74, 61, 69, 34, 79, 73, 68, 77, 77, 59, 73, 81, 90, 65, 79, 86, 84, 93, 95] 0

k\_1000 92

opm 81

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_2.sm case j12019\_2.sm

17 747.3880951404572 s [93, 141] 14.814814814814813 [0, 0, 0, 0, 6, 4, 7, 15, 6, 17, 7, 23, 10, 7, 17, 11, 4, 15, 1, 18, 24, 1, 10, 9, 23, 10, 31, 21, 13, 23, 30, 1, 28, 11, 19, 24, 12, 41, 4, 19, 19, 28, 8, 28, 5, 29, 24, 39, 25, 37, 8, 35, 27, 21, 37, 37, 30, 25, 12, 35, 31, 45, 48, 35, 49, 23, 45, 47, 37, 45, 8, 45, 48, 31, 37, 44, 47, 52, 54, 49, 57, 33, 19, 61, 54, 57, 59, 44, 59, 50, 55, 57, 62, 56, 54, 62, 63, 59, 62, 69, 64, 69, 65, 64, 67, 69, 64, 70, 70, 74, 76, 77, 74, 76, 70, 83, 76, 83, 89, 75, 84, 93] 0

k\_1000 93

opm 83

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_3.sm case j12019\_3.sm

25 727.4439342021942 s [95, 106] 14.457831325301203 [0, 0, 0, 0, 1, 10, 8, 10, 6, 6, 12, 14, 14, 23, 8, 21, 11, 12, 16, 27, 18, 34, 22, 39, 14, 30, 1, 9, 39, 8, 26, 1, 18, 11, 27, 36, 6, 34, 19, 19, 25, 20, 37, 32, 47, 9, 14, 35, 26, 33, 33, 4, 25, 35, 38, 47, 42, 36, 21, 18, 39, 51, 51, 55, 45, 11, 42, 47, 59, 47, 63, 52, 5, 44, 53, 52, 60, 31, 56, 53, 61, 63, 69, 63, 40, 63, 64, 67, 75, 55, 63, 47, 72, 64, 77, 73, 74, 52, 77, 73, 64, 66, 71, 75, 77, 74, 79, 75, 75, 75, 86, 81, 78, 67, 85, 87, 90, 92, 89, 94, 89, 95] 0

k\_1000 94

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_4.sm case j12019\_4.sm

14 688.4364252090454 s [123, 125] 21.782178217821784 [0, 0, 0, 0, 7, 8, 16, 22, 30, 19, 9, 32, 1, 8, 16, 52, 17, 23, 8, 64, 62, 20, 24, 18, 32, 27, 28, 26, 20, 31, 20, 27, 38, 11, 65, 38, 46, 30, 6, 47, 74, 32, 32, 72, 9, 42, 17, 10, 37, 39, 66, 17, 11, 45, 60, 69, 55, 29, 65, 26, 32, 75, 52, 58, 46, 45, 72, 51, 24, 34, 74, 55, 79, 41, 65, 87, 75, 80, 39, 87, 58, 75, 76, 38, 80, 28, 92, 74, 79, 56, 51, 87, 95, 84, 94, 81, 65, 84, 70, 84, 90, 91, 97, 90, 93, 93, 93, 103, 104, 107, 102, 101, 101, 110, 110, 111, 112, 95, 116, 116, 113, 123] 0

k\_1000 95

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_5.sm case j12019\_5.sm

14 680.9656233787537 s [123, 179] 19.41747572815534 [0, 0, 0, 0, 2, 3, 5, 5, 15, 15, 5, 22, 22, 27, 2, 12, 5, 17, 23, 17, 29, 7, 14, 13, 26, 29, 46, 61, 31, 73, 30, 49, 35, 38, 49, 15, 14, 45, 67, 50, 56, 56, 14, 22, 34, 27, 43, 13, 16, 9, 43, 65, 33, 79, 75, 74, 19, 52, 26, 79, 7, 42, 31, 69, 56, 76, 33, 89, 56, 34, 57, 60, 33, 65, 74, 87, 85, 52, 74, 86, 40, 66, 84, 95, 59, 89, 57, 68, 76, 47, 78, 94, 83, 92, 92, 83, 84, 68, 93, 78, 90, 94, 96, 105, 98, 105, 101, 77, 101, 93, 109, 95, 107, 102, 102, 107, 113, 111, 104, 117, 116, 123] 0

k\_1000 96

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_6.sm case j12019\_6.sm

23 727.842554807663 s [104, 186] 15.555555555555555 [0, 0, 0, 0, 1, 1, 7, 2, 1, 2, 12, 2, 19, 7, 7, 12, 8, 13, 5, 12, 9, 11, 9, 8, 14, 17, 17, 21, 14, 22, 29, 36, 30, 38, 34, 21, 26, 28, 34, 24, 7, 20, 39, 40, 22, 14, 34, 38, 45, 19, 43, 46, 43, 25, 26, 21, 35, 26, 41, 50, 35, 44, 46, 41, 8, 50, 28, 31, 43, 55, 41, 48, 44, 50, 34, 48, 54, 56, 54, 52, 53, 51, 59, 56, 57, 58, 56, 45, 60, 63, 62, 54, 61, 62, 64, 64, 65, 63, 74, 65, 55, 71, 79, 81, 68, 69, 70, 81, 79, 74, 74, 79, 90, 79, 84, 86, 93, 88, 96, 96, 93, 104] 0

k\_1000 97

opm 93

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_7.sm case j12019\_7.sm

29 735.8129630088806 s [105, 123] 12.903225806451612 [0, 0, 0, 0, 7, 5, 5, 7, 19, 25, 29, 18, 35, 9, 25, 4, 13, 13, 13, 40, 35, 4, 13, 36, 10, 19, 16, 35, 31, 19, 4, 13, 29, 21, 29, 35, 22, 24, 12, 12, 30, 45, 47, 25, 22, 35, 44, 42, 34, 31, 12, 40, 54, 45, 25, 53, 49, 48, 48, 45, 42, 45, 34, 50, 45, 48, 53, 57, 48, 50, 56, 58, 30, 38, 54, 63, 58, 22, 50, 66, 44, 47, 52, 58, 60, 62, 59, 66, 67, 54, 41, 63, 61, 67, 68, 65, 70, 72, 70, 69, 76, 79, 74, 73, 76, 80, 78, 79, 73, 80, 81, 74, 80, 84, 90, 99, 78, 88, 90, 103, 83, 105] 0

k\_1000 98

opm 93

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_8.sm case j12019\_8.sm

19 698.3296773433685 s [109, 129] 17.20430107526882 [0, 0, 0, 0, 4, 4, 6, 11, 7, 6, 18, 7, 12, 16, 29, 14, 17, 7, 19, 27, 10, 37, 12, 26, 34, 17, 23, 12, 33, 28, 19, 14, 42, 30, 14, 51, 25, 37, 34, 44, 24, 24, 49, 27, 30, 39, 15, 14, 55, 58, 59, 37, 50, 59, 35, 44, 54, 39, 24, 32, 66, 59, 65, 63, 10, 75, 51, 30, 42, 15, 24, 49, 35, 39, 53, 45, 43, 49, 68, 50, 68, 28, 47, 59, 81, 27, 63, 46, 55, 28, 63, 59, 42, 20, 71, 61, 63, 50, 67, 69, 69, 73, 68, 48, 77, 74, 83, 81, 75, 83, 73, 86, 92, 89, 89, 75, 97, 81, 84, 98, 105, 109] 0

k\_1000 99

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j12019\_9.sm case j12019\_9.sm

18 735.9150083065033 s [98, 267] 11.363636363636363 [0, 0, 0, 0, 2, 4, 3, 1, 3, 1, 13, 1, 10, 8, 17, 17, 13, 13, 8, 21, 2, 11, 14, 4, 31, 50, 30, 8, 14, 24, 48, 21, 28, 29, 46, 29, 48, 21, 28, 35, 41, 57, 49, 4, 16, 28, 58, 23, 38, 18, 20, 36, 39, 43, 40, 22, 31, 35, 45, 24, 50, 68, 49, 38, 58, 69, 43, 56, 57, 56, 58, 62, 23, 20, 43, 40, 57, 62, 39, 53, 67, 5, 52, 66, 65, 24, 18, 66, 68, 43, 50, 70, 60, 65, 62, 72, 31, 77, 12, 69, 22, 76, 83, 74, 71, 70, 83, 80, 71, 79, 71, 80, 84, 79, 84, 82, 89, 91, 95, 88, 88, 98] 0

k\_1000 100

opm 104

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_1.sm case j1201\_1.sm

17 730.57386469841 s [120, 287] 15.384615384615385 [0, 0, 0, 0, 4, 4, 10, 2, 4, 6, 20, 6, 2, 10, 4, 23, 10, 26, 21, 16, 10, 33, 28, 51, 54, 6, 31, 32, 34, 14, 39, 14, 35, 23, 31, 44, 41, 7, 21, 25, 44, 26, 53, 11, 44, 19, 16, 45, 55, 62, 14, 62, 10, 33, 33, 53, 21, 21, 73, 31, 35, 47, 64, 37, 7, 20, 49, 39, 19, 39, 46, 19, 35, 71, 61, 49, 55, 47, 62, 82, 61, 68, 32, 95, 68, 92, 72, 42, 92, 100, 74, 104, 85, 46, 47, 49, 41, 72, 50, 107, 61, 84, 77, 82, 85, 67, 95, 74, 73, 90, 68, 68, 100, 107, 101, 103, 106, 71, 117, 112, 107, 120] 0

k\_1000 101

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_10.sm case j1201\_10.sm

21 715.1042985916138 s [109, 184] 0.9259259259259258 [0, 0, 0, 0, 36, 4, 7, 8, 11, 7, 40, 8, 11, 12, 29, 43, 37, 24, 4, 6, 29, 24, 17, 8, 26, 9, 48, 43, 44, 34, 17, 9, 17, 12, 20, 12, 37, 26, 17, 37, 13, 20, 27, 51, 26, 43, 27, 22, 16, 51, 34, 73, 47, 17, 27, 27, 27, 58, 38, 42, 34, 34, 39, 43, 48, 47, 48, 68, 47, 17, 36, 58, 11, 20, 51, 27, 38, 45, 78, 30, 23, 36, 51, 55, 47, 38, 44, 47, 47, 36, 73, 17, 12, 56, 78, 47, 58, 55, 53, 85, 48, 73, 61, 61, 61, 54, 71, 85, 87, 65, 72, 78, 51, 91, 87, 78, 81, 93, 102, 99, 95, 109] 0

k\_1000 102

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_2.sm case j1201\_2.sm

25 704.2257618904114 s [127, 143] 16.51376146788991 [0, 0, 0, 0, 1, 1, 12, 5, 19, 9, 9, 9, 10, 19, 9, 28, 34, 10, 22, 19, 19, 10, 27, 35, 5, 24, 33, 5, 2, 5, 19, 24, 30, 13, 35, 39, 59, 35, 29, 41, 34, 24, 34, 48, 30, 40, 41, 45, 63, 66, 45, 27, 27, 55, 35, 55, 66, 59, 20, 68, 64, 3, 20, 49, 68, 41, 39, 42, 11, 30, 78, 39, 38, 74, 57, 47, 82, 32, 57, 41, 85, 24, 45, 40, 59, 76, 63, 85, 51, 35, 68, 82, 74, 52, 76, 48, 57, 83, 90, 12, 43, 103, 82, 55, 71, 95, 71, 95, 70, 78, 71, 85, 83, 103, 103, 105, 109, 119, 107, 122, 114, 127] 0

k\_1000 103

opm 125

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_3.sm case j1201\_3.sm

0 14.638492345809937 s [111, 141] -11.200000000000001 [0, 0, 0, 0, 3, 29, 3, 48, 6, 3, 6, 57, 46, 8, 4, 38, 35, 44, 13, 59, 37, 4, 45, 59, 8, 59, 7, 35, 10, 7, 66, 8, 13, 13, 67, 8, 69, 75, 70, 69, 57, 10, 10, 61, 52, 35, 10, 46, 23, 27, 39, 52, 52, 10, 15, 66, 44, 44, 13, 15, 37, 73, 69, 69, 67, 7, 76, 54, 13, 23, 14, 31, 46, 74, 62, 27, 71, 46, 46, 83, 77, 69, 46, 46, 54, 85, 22, 62, 89, 75, 35, 72, 18, 15, 85, 46, 48, 23, 84, 23, 77, 38, 65, 57, 98, 48, 47, 76, 79, 90, 100, 104, 82, 90, 74, 90, 99, 85, 107, 100, 106, 111] 0

k\_1000 104

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_4.sm case j1201\_4.sm

21 738.6705212593079 s [108, 135] 11.34020618556701 [0, 0, 0, 0, 2, 4, 5, 13, 5, 6, 6, 2, 2, 15, 15, 48, 45, 21, 3, 12, 8, 16, 5, 13, 21, 15, 9, 41, 45, 38, 13, 19, 14, 52, 28, 19, 19, 62, 15, 13, 6, 35, 20, 23, 33, 23, 36, 37, 23, 28, 35, 9, 35, 52, 58, 44, 33, 31, 45, 37, 56, 19, 59, 23, 44, 41, 31, 75, 46, 62, 46, 59, 19, 82, 30, 12, 68, 52, 72, 62, 72, 58, 68, 25, 23, 76, 56, 63, 68, 67, 37, 41, 20, 22, 53, 76, 57, 68, 52, 74, 19, 75, 63, 78, 59, 94, 80, 82, 82, 80, 81, 88, 81, 87, 89, 90, 91, 94, 101, 93, 101, 108] 0

k\_1000 105

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_5.sm case j1201\_5.sm

26 709.395357131958 s [127, 163] 13.392857142857142 [0, 0, 0, 0, 10, 17, 10, 10, 4, 17, 11, 20, 17, 28, 30, 69, 28, 34, 33, 55, 26, 38, 11, 20, 49, 42, 56, 44, 26, 17, 64, 56, 33, 55, 34, 52, 69, 32, 65, 29, 56, 40, 27, 29, 34, 64, 68, 12, 30, 33, 68, 87, 71, 77, 65, 71, 28, 18, 34, 68, 56, 42, 50, 52, 74, 56, 49, 35, 42, 42, 44, 84, 55, 79, 82, 51, 51, 38, 27, 73, 78, 78, 38, 69, 89, 71, 42, 76, 88, 91, 77, 76, 61, 77, 89, 40, 97, 71, 82, 101, 93, 85, 56, 47, 98, 85, 78, 101, 108, 59, 76, 79, 103, 87, 115, 106, 111, 86, 120, 120, 121, 127] 0

k\_1000 106

opm 84

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_6.sm case j1201\_6.sm

34 700.7188215255737 s [86, 140] 2.380952380952381 [0, 3, 0, 0, 1, 1, 1, 9, 6, 8, 6, 6, 8, 3, 9, 4, 20, 25, 11, 17, 18, 21, 9, 20, 18, 6, 21, 34, 26, 8, 3, 19, 20, 17, 28, 3, 21, 36, 26, 13, 35, 43, 11, 10, 20, 17, 22, 5, 36, 30, 20, 47, 27, 14, 26, 45, 19, 13, 18, 41, 26, 37, 13, 43, 13, 37, 51, 25, 20, 43, 36, 20, 47, 55, 55, 35, 8, 27, 40, 38, 13, 10, 59, 24, 46, 39, 50, 51, 19, 49, 62, 20, 54, 51, 64, 13, 58, 47, 44, 18, 27, 36, 64, 71, 41, 60, 28, 69, 54, 75, 46, 72, 62, 51, 73, 69, 76, 77, 77, 78, 63, 86] 0

k\_1000 107

opm 117

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_7.sm case j1201\_7.sm

19 728.7409086227417 s [131, 156] 11.965811965811966 [0, 10, 0, 0, 10, 10, 14, 19, 19, 22, 10, 55, 14, 19, 19, 22, 25, 19, 27, 25, 25, 6, 16, 37, 18, 27, 34, 37, 44, 16, 35, 34, 38, 44, 14, 34, 52, 45, 35, 50, 52, 44, 58, 44, 33, 22, 45, 53, 64, 73, 57, 62, 37, 44, 45, 52, 67, 76, 72, 54, 55, 44, 73, 78, 29, 81, 79, 97, 74, 60, 25, 81, 34, 76, 85, 74, 51, 68, 104, 60, 25, 114, 91, 30, 62, 75, 85, 34, 84, 72, 81, 30, 73, 95, 23, 60, 37, 91, 92, 97, 94, 97, 72, 99, 112, 95, 37, 114, 118, 106, 55, 117, 104, 97, 105, 99, 119, 124, 122, 129, 121, 131] 0

k\_1000 108

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_8.sm case j1201\_8.sm

19 497.0491900444031 s [107, 123] -1.834862385321101 [0, 0, 0, 0, 3, 3, 10, 1, 9, 9, 14, 1, 3, 1, 10, 10, 10, 17, 14, 14, 43, 17, 16, 22, 17, 20, 9, 18, 18, 34, 8, 24, 30, 25, 32, 24, 47, 37, 29, 39, 26, 14, 29, 33, 30, 39, 36, 47, 34, 22, 8, 42, 47, 66, 29, 20, 8, 39, 43, 73, 16, 82, 25, 20, 55, 30, 30, 48, 51, 61, 45, 44, 57, 53, 61, 14, 60, 72, 24, 86, 51, 39, 62, 47, 29, 54, 61, 67, 62, 80, 46, 66, 39, 62, 65, 72, 32, 74, 82, 67, 50, 72, 86, 46, 80, 72, 86, 87, 88, 74, 90, 57, 63, 76, 93, 93, 74, 99, 101, 84, 102, 107] 0

k\_1000 109

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j1201\_9.sm case j1201\_9.sm

14 711.637894153595 s [136, 182] 21.428571428571427 [0, 8, 0, 0, 9, 10, 9, 2, 6, 10, 2, 2, 11, 11, 6, 20, 11, 23, 20, 18, 59, 18, 54, 62, 10, 20, 8, 20, 16, 13, 26, 66, 29, 69, 31, 20, 29, 39, 17, 11, 29, 11, 76, 56, 63, 39, 26, 20, 32, 9, 30, 21, 22, 19, 25, 21, 39, 46, 9, 62, 45, 81, 39, 31, 76, 53, 27, 49, 59, 36, 76, 16, 49, 39, 11, 40, 60, 29, 26, 36, 45, 16, 63, 76, 81, 31, 76, 80, 81, 82, 45, 91, 84, 20, 47, 77, 47, 66, 91, 54, 85, 17, 60, 93, 67, 98, 107, 64, 98, 84, 106, 114, 116, 114, 116, 124, 67, 126, 100, 121, 133, 136] 0

k\_1000 110

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_1.sm case j12020\_1.sm

34 725.6795053482056 s [101, 123] 13.48314606741573 [0, 0, 0, 0, 8, 3, 3, 3, 8, 3, 7, 8, 52, 13, 12, 12, 14, 19, 6, 12, 14, 52, 12, 13, 45, 21, 7, 17, 19, 19, 12, 12, 23, 45, 19, 13, 24, 12, 28, 18, 29, 37, 41, 23, 29, 22, 22, 37, 16, 30, 22, 25, 48, 37, 14, 22, 53, 34, 45, 29, 47, 23, 13, 34, 21, 43, 54, 59, 66, 48, 22, 49, 54, 41, 40, 39, 41, 47, 28, 54, 52, 30, 59, 53, 25, 30, 56, 42, 62, 40, 65, 61, 49, 73, 57, 56, 37, 40, 62, 57, 46, 49, 66, 63, 63, 72, 73, 42, 69, 75, 63, 48, 73, 69, 80, 82, 85, 85, 95, 72, 75, 101] 0

k\_1000 111

opm 81

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_10.sm case j12020\_10.sm

26 702.5094380378723 s [85, 137] 4.938271604938271 [0, 0, 0, 0, 4, 2, 4, 4, 2, 4, 4, 4, 9, 7, 11, 20, 11, 16, 2, 29, 16, 58, 27, 10, 14, 22, 14, 16, 7, 16, 51, 29, 13, 35, 4, 9, 22, 14, 9, 17, 40, 17, 26, 31, 21, 43, 33, 33, 43, 25, 20, 15, 17, 51, 38, 26, 13, 38, 20, 26, 19, 45, 44, 56, 33, 30, 61, 26, 19, 27, 51, 43, 29, 35, 20, 64, 43, 37, 49, 53, 26, 48, 35, 24, 26, 34, 68, 61, 16, 68, 53, 39, 45, 53, 40, 37, 46, 53, 58, 66, 47, 49, 54, 68, 75, 61, 62, 60, 63, 66, 76, 66, 67, 68, 61, 75, 69, 75, 78, 77, 71, 85] 0

k\_1000 112

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_2.sm case j12020\_2.sm

23 706.4080865383148 s [101, 111] 2.0202020202020203 [0, 0, 0, 0, 4, 4, 12, 13, 4, 16, 4, 12, 21, 14, 4, 3, 31, 34, 17, 8, 16, 31, 15, 27, 8, 14, 8, 4, 17, 20, 31, 12, 17, 36, 34, 8, 34, 40, 41, 15, 23, 22, 20, 8, 12, 27, 18, 36, 23, 43, 24, 43, 23, 25, 40, 43, 45, 53, 47, 51, 56, 54, 48, 61, 52, 59, 32, 54, 63, 27, 29, 37, 56, 45, 32, 48, 65, 25, 70, 66, 12, 63, 24, 65, 32, 37, 66, 53, 69, 65, 59, 28, 66, 46, 53, 51, 54, 60, 54, 40, 67, 57, 39, 76, 71, 67, 70, 74, 73, 60, 81, 78, 80, 67, 75, 81, 90, 95, 91, 73, 96, 101] 0

k\_1000 113

opm 77

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_3.sm case j12020\_3.sm

27 731.3033268451691 s [87, 141] 12.987012987012985 [0, 0, 0, 0, 2, 2, 6, 4, 2, 2, 7, 14, 12, 7, 7, 6, 4, 20, 10, 6, 21, 12, 13, 25, 21, 14, 31, 14, 13, 29, 30, 31, 47, 28, 21, 27, 47, 41, 16, 40, 4, 11, 31, 38, 14, 13, 24, 11, 39, 21, 33, 10, 40, 2, 17, 9, 36, 44, 32, 28, 42, 49, 49, 54, 31, 32, 12, 17, 21, 55, 41, 40, 63, 59, 43, 50, 44, 58, 49, 56, 48, 28, 50, 58, 60, 57, 50, 21, 49, 62, 73, 39, 57, 54, 43, 35, 14, 63, 66, 66, 59, 71, 49, 60, 52, 60, 66, 37, 74, 72, 64, 72, 65, 79, 76, 75, 80, 84, 85, 83, 74, 87] 0

k\_1000 114

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_4.sm case j12020\_4.sm

31 671.0828747749329 s [89, 160] 0.0 [0, 0, 0, 0, 5, 5, 8, 10, 9, 8, 5, 11, 20, 9, 11, 8, 9, 30, 17, 13, 9, 18, 22, 24, 27, 36, 18, 16, 33, 37, 22, 37, 48, 41, 24, 25, 30, 41, 18, 28, 9, 34, 33, 14, 30, 36, 36, 20, 32, 47, 22, 14, 18, 20, 30, 19, 43, 40, 50, 37, 38, 53, 27, 38, 35, 47, 37, 19, 24, 47, 20, 24, 31, 46, 60, 17, 32, 39, 40, 41, 34, 52, 47, 56, 47, 51, 49, 35, 47, 54, 46, 27, 61, 59, 55, 62, 26, 55, 58, 60, 45, 20, 65, 63, 63, 50, 60, 47, 71, 79, 67, 49, 60, 77, 52, 63, 72, 73, 81, 86, 81, 89] 0

k\_1000 115

opm 69

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_5.sm case j12020\_5.sm

53 724.337170124054 s [73, 84] 5.797101449275362 [0, 0, 0, 0, 5, 5, 11, 15, 15, 10, 15, 14, 23, 11, 14, 5, 33, 15, 13, 33, 14, 10, 19, 13, 35, 5, 33, 26, 30, 25, 5, 19, 21, 12, 10, 19, 22, 17, 19, 25, 13, 33, 14, 26, 35, 33, 21, 30, 30, 15, 27, 39, 23, 35, 30, 38, 40, 20, 18, 21, 44, 18, 33, 45, 42, 37, 27, 37, 41, 37, 18, 34, 32, 31, 41, 39, 48, 48, 40, 34, 34, 47, 34, 50, 33, 45, 35, 48, 50, 43, 48, 42, 30, 53, 48, 49, 56, 49, 44, 41, 53, 46, 54, 55, 59, 46, 50, 37, 43, 50, 46, 56, 56, 56, 63, 63, 63, 63, 68, 67, 70, 73] 0

k\_1000 116

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_6.sm case j12020\_6.sm

18 205.07810711860657 s [80, 80] 0.0 [0, 0, 0, 0, 3, 3, 4, 3, 6, 13, 4, 10, 41, 6, 4, 31, 10, 34, 4, 12, 7, 14, 21, 12, 20, 13, 6, 30, 6, 19, 22, 40, 15, 4, 15, 20, 28, 7, 13, 20, 24, 32, 24, 8, 30, 30, 17, 15, 25, 31, 26, 18, 22, 14, 34, 34, 47, 10, 37, 35, 31, 18, 30, 32, 30, 23, 34, 40, 33, 48, 14, 39, 41, 50, 31, 38, 31, 34, 29, 34, 10, 46, 46, 36, 41, 18, 47, 38, 37, 47, 33, 49, 32, 43, 43, 37, 48, 38, 54, 53, 23, 53, 54, 29, 38, 57, 57, 59, 35, 59, 43, 54, 59, 64, 68, 66, 62, 64, 76, 73, 65, 80] 0

k\_1000 117

opm 81

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_7.sm case j12020\_7.sm

18 291.62047290802 s [81, 88] 0.0 [0, 0, 0, 0, 8, 4, 12, 12, 3, 8, 9, 3, 12, 14, 18, 7, 3, 11, 4, 11, 4, 6, 16, 23, 15, 21, 18, 16, 26, 28, 6, 10, 8, 29, 7, 4, 10, 22, 28, 37, 14, 13, 30, 22, 36, 14, 10, 24, 31, 38, 11, 28, 16, 26, 14, 46, 32, 38, 31, 38, 41, 19, 42, 36, 45, 37, 30, 40, 22, 23, 20, 8, 49, 32, 18, 21, 49, 39, 24, 45, 47, 20, 13, 38, 45, 21, 46, 48, 47, 57, 52, 47, 49, 34, 40, 65, 52, 50, 25, 57, 53, 53, 42, 57, 53, 52, 66, 58, 54, 59, 54, 61, 63, 58, 62, 67, 63, 63, 72, 71, 72, 81] 0

k\_1000 118

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_8.sm case j12020\_8.sm

26 716.1480565071106 s [111, 117] 3.7383177570093453 [0, 0, 0, 0, 9, 12, 20, 9, 26, 19, 20, 31, 3, 32, 38, 26, 39, 43, 27, 52, 44, 42, 3, 49, 19, 15, 32, 8, 7, 26, 34, 7, 39, 9, 26, 42, 21, 8, 19, 37, 53, 11, 29, 49, 12, 21, 37, 45, 60, 49, 12, 63, 72, 39, 13, 61, 59, 51, 17, 25, 47, 32, 60, 61, 22, 49, 3, 37, 76, 27, 68, 63, 54, 13, 53, 73, 27, 40, 54, 62, 66, 65, 71, 72, 74, 62, 59, 73, 43, 81, 66, 59, 78, 89, 79, 73, 68, 42, 56, 71, 84, 81, 75, 74, 90, 75, 78, 86, 88, 92, 86, 88, 96, 96, 98, 84, 93, 98, 107, 95, 99, 111] 0

k\_1000 119

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j12020\_9.sm case j12020\_9.sm

55 718.9221067428589 s [82, 143] 2.5 [0, 0, 0, 0, 4, 8, 8, 4, 20, 22, 19, 16, 14, 12, 14, 14, 29, 12, 8, 32, 27, 14, 27, 37, 28, 14, 35, 14, 17, 41, 38, 20, 12, 17, 17, 36, 18, 24, 24, 27, 45, 37, 12, 28, 24, 17, 31, 40, 19, 40, 16, 37, 44, 20, 33, 8, 15, 36, 20, 24, 20, 26, 28, 44, 43, 46, 38, 36, 32, 41, 35, 51, 26, 31, 27, 33, 4, 51, 45, 52, 46, 33, 45, 28, 20, 27, 43, 48, 51, 50, 33, 37, 47, 40, 53, 48, 58, 41, 53, 41, 34, 55, 51, 63, 56, 59, 45, 51, 48, 53, 54, 64, 72, 63, 64, 70, 65, 69, 75, 79, 59, 82] 0

k\_1000 120

opm 114

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_1.sm case j12021\_1.sm

25 727.2066743373871 s [126, 135] 10.526315789473683 [0, 0, 0, 0, 10, 10, 1, 1, 3, 14, 12, 13, 3, 3, 20, 10, 13, 15, 3, 10, 31, 26, 10, 13, 12, 25, 16, 12, 15, 31, 31, 13, 11, 21, 15, 14, 40, 23, 16, 14, 49, 41, 45, 20, 36, 46, 59, 20, 10, 17, 31, 25, 25, 67, 45, 64, 42, 51, 36, 66, 1, 26, 53, 86, 46, 15, 23, 76, 33, 76, 6, 41, 29, 46, 40, 55, 78, 81, 59, 59, 51, 48, 68, 72, 68, 80, 48, 57, 94, 76, 80, 46, 75, 51, 62, 24, 64, 55, 74, 98, 85, 78, 81, 41, 98, 98, 98, 89, 78, 94, 100, 98, 108, 100, 108, 103, 106, 101, 115, 116, 116, 126] 0

k\_1000 121

opm 102

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_10.sm case j12021\_10.sm

27 718.4155204296112 s [116, 140] 13.725490196078432 [0, 0, 0, 0, 7, 8, 19, 7, 7, 26, 9, 16, 10, 16, 15, 11, 15, 17, 42, 23, 16, 8, 18, 8, 19, 7, 8, 19, 23, 10, 24, 19, 18, 17, 19, 24, 23, 42, 38, 30, 35, 36, 34, 25, 30, 33, 53, 15, 42, 44, 54, 11, 29, 35, 63, 52, 21, 15, 46, 36, 34, 53, 70, 34, 42, 40, 23, 16, 46, 47, 19, 63, 46, 59, 17, 20, 56, 54, 78, 67, 52, 29, 59, 63, 36, 24, 64, 38, 72, 36, 47, 35, 72, 72, 39, 66, 66, 66, 68, 79, 85, 70, 63, 60, 88, 75, 81, 63, 96, 40, 85, 89, 81, 99, 89, 96, 100, 99, 109, 97, 105, 116] 0

k\_1000 122

opm 117

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_2.sm case j12021\_2.sm

24 732.0349972248077 s [130, 558] 11.11111111111111 [0, 0, 0, 0, 10, 10, 4, 4, 7, 8, 7, 12, 24, 20, 20, 29, 4, 26, 39, 45, 15, 7, 24, 20, 25, 26, 52, 33, 12, 24, 42, 20, 20, 45, 26, 25, 58, 12, 54, 45, 42, 59, 46, 66, 35, 16, 69, 20, 35, 37, 35, 23, 54, 67, 64, 26, 26, 39, 52, 72, 73, 15, 64, 59, 45, 37, 70, 54, 73, 24, 78, 62, 80, 51, 39, 56, 65, 72, 73, 90, 20, 32, 69, 94, 62, 53, 75, 72, 52, 30, 34, 78, 100, 81, 96, 43, 77, 103, 84, 100, 90, 100, 101, 103, 69, 110, 86, 100, 118, 103, 113, 123, 93, 110, 93, 120, 123, 117, 125, 126, 78, 130] 0

k\_1000 123

opm 143

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_3.sm case j12021\_3.sm

26 721.55220079422 s [151, 162] 5.594405594405594 [0, 0, 0, 10, 10, 10, 20, 15, 27, 20, 27, 10, 36, 36, 17, 43, 27, 17, 56, 53, 29, 59, 36, 41, 28, 45, 27, 25, 56, 17, 57, 43, 27, 54, 36, 67, 67, 43, 70, 39, 75, 22, 17, 45, 53, 69, 83, 78, 78, 56, 48, 57, 45, 54, 31, 36, 33, 56, 53, 78, 88, 83, 38, 57, 87, 67, 41, 91, 60, 67, 70, 67, 39, 29, 97, 70, 51, 67, 91, 50, 67, 99, 58, 97, 85, 77, 75, 70, 116, 101, 50, 101, 77, 84, 78, 108, 90, 108, 108, 111, 112, 87, 84, 115, 131, 57, 95, 122, 114, 112, 108, 112, 116, 117, 140, 112, 131, 140, 142, 144, 115, 151] 0

k\_1000 124

opm 135

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_4.sm case j12021\_4.sm

18 688.1103661060333 s [149, 154] 10.37037037037037 [0, 0, 0, 0, 1, 5, 6, 1, 32, 1, 17, 6, 9, 10, 9, 17, 9, 22, 36, 19, 19, 19, 61, 10, 22, 55, 70, 31, 40, 22, 45, 8, 25, 34, 10, 34, 29, 25, 53, 44, 48, 12, 60, 6, 17, 53, 62, 10, 39, 19, 81, 61, 29, 40, 19, 34, 83, 39, 22, 71, 52, 73, 45, 83, 79, 47, 22, 45, 87, 64, 81, 53, 79, 53, 39, 89, 39, 63, 70, 89, 89, 63, 96, 84, 89, 54, 87, 99, 45, 98, 53, 107, 112, 67, 94, 87, 107, 70, 107, 72, 63, 116, 99, 114, 105, 117, 117, 107, 123, 114, 133, 125, 99, 132, 117, 113, 122, 140, 141, 121, 143, 149] 0

k\_1000 125

opm 110

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_5.sm case j12021\_5.sm

30 734.0922045707703 s [124, 167] 12.727272727272727 [0, 0, 0, 0, 9, 9, 15, 4, 4, 3, 7, 23, 9, 4, 3, 18, 11, 6, 18, 10, 23, 26, 15, 7, 23, 33, 23, 30, 30, 38, 13, 13, 33, 41, 20, 17, 44, 40, 11, 17, 14, 33, 40, 14, 44, 18, 50, 27, 26, 33, 21, 64, 55, 29, 10, 11, 73, 26, 28, 52, 23, 55, 23, 41, 16, 18, 6, 67, 49, 73, 11, 73, 60, 70, 41, 47, 61, 24, 58, 10, 60, 20, 66, 76, 31, 28, 66, 58, 32, 28, 78, 67, 67, 44, 88, 54, 78, 95, 71, 38, 61, 80, 69, 80, 49, 79, 75, 104, 97, 88, 99, 95, 104, 105, 115, 108, 112, 112, 122, 112, 117, 124] 0

k\_1000 126

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_6.sm case j12021\_6.sm

30 707.3464360237122 s [120, 163] 10.091743119266056 [0, 0, 0, 0, 3, 10, 3, 5, 15, 3, 10, 19, 5, 15, 15, 19, 21, 4, 21, 7, 28, 10, 4, 30, 10, 19, 15, 22, 41, 7, 39, 39, 30, 22, 13, 5, 21, 19, 11, 27, 13, 39, 7, 22, 27, 22, 7, 50, 39, 30, 31, 58, 11, 61, 31, 23, 22, 63, 44, 62, 27, 71, 39, 28, 58, 62, 28, 27, 78, 50, 61, 72, 50, 42, 58, 18, 48, 22, 77, 28, 72, 61, 78, 54, 26, 25, 68, 27, 61, 63, 80, 81, 84, 92, 48, 68, 80, 80, 71, 72, 85, 89, 86, 78, 101, 66, 85, 92, 86, 93, 81, 87, 86, 90, 107, 93, 101, 101, 110, 101, 115, 120] 0

k\_1000 127

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_7.sm case j12021\_7.sm

31 710.5184483528137 s [118, 258] 6.306306306306306 [0, 9, 0, 0, 2, 9, 9, 11, 21, 2, 4, 9, 2, 4, 16, 18, 19, 11, 6, 10, 21, 28, 29, 20, 29, 10, 14, 21, 28, 34, 23, 29, 37, 39, 42, 38, 17, 2, 21, 38, 47, 23, 39, 29, 34, 32, 34, 28, 39, 47, 43, 50, 47, 22, 4, 50, 56, 36, 36, 42, 36, 35, 35, 2, 43, 73, 66, 48, 42, 62, 63, 66, 36, 57, 60, 57, 16, 43, 43, 38, 49, 60, 60, 87, 44, 66, 85, 42, 25, 49, 69, 87, 70, 63, 66, 93, 82, 95, 56, 85, 79, 70, 57, 85, 97, 93, 95, 14, 66, 65, 95, 63, 73, 100, 106, 96, 101, 102, 82, 107, 111, 118] 0

k\_1000 128

opm 127

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_8.sm case j12021\_8.sm

22 695.3842170238495 s [151, 152] 18.89763779527559 [0, 0, 0, 0, 7, 8, 8, 13, 15, 28, 13, 23, 30, 30, 13, 8, 13, 40, 16, 36, 13, 43, 37, 20, 33, 8, 3, 45, 13, 49, 54, 49, 23, 20, 23, 33, 48, 48, 20, 45, 19, 65, 58, 8, 7, 28, 24, 30, 43, 59, 43, 67, 87, 60, 15, 67, 36, 46, 59, 58, 36, 77, 30, 54, 69, 60, 33, 98, 34, 54, 77, 58, 87, 60, 39, 77, 70, 78, 62, 76, 77, 81, 81, 95, 96, 96, 65, 84, 97, 107, 76, 68, 78, 82, 82, 82, 99, 117, 89, 87, 96, 96, 89, 106, 90, 107, 111, 117, 48, 126, 126, 109, 99, 118, 136, 78, 109, 126, 129, 121, 141, 151] 0

k\_1000 129

opm 102

the random choice case path in j120 ./rcpsp/j120.sm/j12021\_9.sm case j12021\_9.sm

26 731.8763694763184 s [117, 119] 14.705882352941178 [0, 9, 0, 0, 6, 10, 12, 14, 14, 16, 9, 19, 10, 17, 26, 19, 6, 14, 32, 21, 19, 22, 21, 19, 11, 19, 22, 45, 21, 33, 25, 23, 12, 50, 26, 35, 27, 44, 30, 31, 41, 11, 28, 44, 55, 30, 34, 26, 60, 41, 44, 31, 47, 56, 15, 55, 81, 35, 33, 63, 23, 37, 10, 43, 42, 37, 6, 15, 44, 59, 55, 65, 52, 45, 20, 63, 47, 72, 65, 34, 26, 44, 54, 68, 52, 53, 59, 50, 47, 60, 72, 60, 72, 73, 82, 81, 45, 70, 83, 47, 55, 70, 60, 91, 72, 83, 90, 74, 96, 104, 94, 76, 91, 79, 105, 91, 96, 104, 112, 112, 81, 117] 0

k\_1000 130

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_1.sm case j12022\_1.sm

35 719.1851606369019 s [113, 151] 11.881188118811881 [0, 0, 0, 0, 4, 24, 18, 14, 2, 27, 27, 15, 32, 34, 15, 14, 4, 42, 24, 14, 18, 35, 32, 47, 24, 27, 45, 47, 27, 35, 18, 42, 39, 20, 28, 45, 51, 52, 52, 45, 2, 32, 52, 27, 56, 35, 43, 56, 49, 27, 55, 63, 18, 56, 53, 5, 38, 55, 27, 66, 61, 60, 60, 71, 66, 70, 27, 33, 65, 24, 49, 32, 61, 62, 5, 69, 45, 42, 57, 45, 42, 50, 61, 71, 69, 84, 47, 52, 69, 69, 61, 79, 71, 53, 88, 94, 79, 80, 79, 83, 80, 78, 71, 79, 89, 79, 88, 94, 95, 104, 94, 104, 99, 99, 89, 68, 89, 104, 107, 109, 109, 113] 0

k\_1000 131

opm 79

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_10.sm case j12022\_10.sm

45 716.6574001312256 s [81, 251] 2.5316455696202533 [0, 0, 0, 0, 6, 4, 4, 2, 6, 7, 8, 3, 18, 7, 21, 6, 4, 2, 8, 3, 11, 17, 8, 3, 13, 25, 11, 14, 14, 11, 16, 18, 14, 17, 17, 17, 24, 20, 24, 18, 21, 27, 21, 11, 14, 13, 21, 20, 22, 32, 39, 40, 31, 18, 39, 30, 42, 37, 27, 31, 36, 22, 39, 19, 25, 41, 27, 24, 39, 42, 48, 40, 36, 42, 63, 30, 39, 37, 31, 47, 16, 49, 40, 37, 54, 39, 55, 46, 42, 32, 40, 47, 61, 61, 17, 46, 50, 42, 64, 43, 57, 71, 49, 45, 54, 54, 64, 55, 64, 66, 63, 63, 64, 74, 64, 74, 73, 78, 76, 79, 71, 81] 0

k\_1000 132

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_2.sm case j12022\_2.sm

31 729.92418384552 s [116, 160] 8.411214953271028 [0, 0, 0, 0, 8, 4, 13, 13, 13, 22, 8, 4, 22, 22, 18, 14, 6, 22, 18, 8, 8, 43, 16, 8, 14, 24, 25, 24, 28, 27, 26, 24, 27, 34, 34, 27, 31, 49, 37, 26, 28, 37, 42, 6, 32, 29, 35, 39, 14, 62, 28, 8, 36, 16, 46, 36, 54, 57, 30, 19, 36, 46, 59, 18, 67, 14, 67, 31, 37, 37, 46, 59, 52, 72, 36, 43, 41, 50, 44, 65, 59, 23, 38, 60, 60, 65, 75, 49, 54, 70, 57, 77, 63, 72, 74, 67, 26, 74, 74, 67, 70, 76, 80, 72, 75, 90, 80, 77, 96, 84, 99, 94, 104, 84, 84, 90, 96, 105, 94, 112, 111, 116] 0

k\_1000 133

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_3.sm case j12022\_3.sm

37 711.5617649555206 s [98, 184] 2.083333333333333 [0, 0, 0, 0, 7, 3, 13, 13, 2, 9, 2, 9, 28, 17, 11, 31, 19, 11, 27, 17, 22, 17, 34, 16, 17, 22, 24, 33, 3, 35, 27, 20, 9, 19, 34, 19, 25, 19, 27, 22, 36, 29, 12, 29, 20, 37, 29, 37, 41, 20, 42, 30, 41, 20, 31, 27, 32, 20, 33, 41, 37, 34, 27, 44, 41, 47, 47, 21, 12, 47, 48, 40, 54, 36, 54, 48, 53, 48, 43, 37, 47, 64, 57, 45, 55, 43, 62, 48, 58, 67, 70, 55, 62, 62, 71, 57, 63, 71, 65, 70, 72, 67, 64, 47, 75, 73, 81, 81, 81, 73, 53, 91, 78, 67, 78, 86, 74, 68, 88, 88, 92, 98] 0

k\_1000 134

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_4.sm case j12022\_4.sm

40 718.4111852645874 s [91, 117] 1.1111111111111112 [0, 0, 0, 0, 3, 10, 3, 13, 3, 6, 13, 20, 6, 13, 16, 3, 3, 17, 23, 17, 17, 13, 7, 7, 24, 6, 20, 32, 14, 35, 27, 3, 11, 40, 35, 38, 32, 27, 40, 30, 46, 8, 9, 20, 24, 9, 48, 55, 35, 46, 36, 8, 24, 44, 17, 25, 40, 28, 27, 32, 17, 30, 25, 40, 43, 45, 38, 37, 7, 57, 16, 20, 41, 47, 57, 64, 16, 34, 58, 32, 43, 69, 47, 38, 65, 21, 65, 63, 46, 32, 65, 71, 51, 66, 20, 74, 26, 80, 48, 71, 70, 74, 63, 79, 57, 65, 73, 46, 71, 65, 52, 73, 71, 80, 80, 61, 84, 83, 88, 80, 84, 91] 0

k\_1000 135

opm 93

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_5.sm case j12022\_5.sm

31 716.906409740448 s [96, 132] 3.225806451612903 [0, 0, 0, 0, 7, 3, 3, 3, 6, 7, 7, 15, 7, 6, 12, 17, 16, 8, 19, 6, 8, 19, 9, 23, 18, 8, 16, 8, 21, 16, 25, 18, 17, 22, 33, 19, 22, 16, 26, 27, 28, 19, 22, 35, 6, 25, 22, 35, 33, 45, 35, 33, 29, 38, 29, 26, 50, 35, 46, 22, 38, 21, 17, 30, 46, 24, 34, 7, 16, 41, 56, 38, 51, 29, 65, 47, 30, 29, 42, 46, 38, 29, 65, 43, 25, 67, 47, 56, 57, 56, 55, 74, 49, 57, 51, 84, 46, 67, 64, 57, 64, 75, 81, 58, 68, 64, 72, 78, 73, 66, 71, 57, 74, 83, 82, 84, 91, 88, 87, 93, 94, 96] 0

k\_1000 136

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_6.sm case j12022\_6.sm

34 720.1094806194305 s [112, 138] 8.737864077669903 [0, 0, 0, 0, 6, 10, 10, 17, 20, 10, 11, 27, 18, 10, 11, 26, 10, 15, 54, 21, 18, 63, 35, 27, 30, 27, 15, 10, 12, 28, 38, 48, 42, 33, 53, 16, 38, 15, 35, 29, 27, 17, 53, 21, 37, 33, 26, 58, 25, 26, 20, 38, 35, 44, 26, 48, 63, 47, 44, 43, 35, 38, 45, 25, 72, 68, 44, 46, 44, 36, 68, 22, 44, 48, 41, 53, 71, 48, 71, 78, 58, 58, 87, 60, 75, 53, 50, 75, 53, 75, 81, 62, 75, 51, 82, 79, 48, 79, 82, 93, 84, 75, 82, 92, 62, 62, 84, 87, 84, 89, 92, 86, 88, 96, 106, 89, 78, 93, 102, 110, 103, 112] 0

k\_1000 137

opm 133

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_7.sm case j12022\_7.sm

36 711.76149725914 s [134, 145] 0.7518796992481203 [0, 2, 0, 0, 6, 12, 12, 16, 12, 24, 33, 6, 2, 43, 50, 2, 12, 52, 55, 49, 8, 24, 58, 61, 2, 68, 17, 25, 13, 43, 52, 74, 77, 21, 79, 55, 33, 21, 80, 25, 24, 44, 33, 50, 21, 101, 27, 74, 25, 50, 74, 27, 50, 25, 66, 39, 80, 32, 37, 80, 41, 83, 41, 54, 58, 95, 55, 26, 90, 61, 61, 67, 37, 61, 91, 25, 90, 85, 16, 73, 85, 33, 41, 64, 69, 26, 49, 104, 77, 89, 90, 49, 91, 99, 101, 60, 96, 80, 71, 83, 55, 33, 103, 99, 107, 104, 103, 85, 110, 99, 107, 115, 109, 120, 111, 121, 115, 112, 123, 127, 114, 134] 0

k\_1000 138

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_8.sm case j12022\_8.sm

36 730.3360319137573 s [112, 176] 8.737864077669903 [0, 0, 0, 0, 8, 7, 5, 23, 7, 5, 9, 18, 35, 21, 13, 13, 9, 5, 13, 25, 13, 29, 18, 13, 22, 32, 22, 15, 13, 22, 11, 29, 21, 32, 41, 21, 11, 25, 21, 32, 28, 50, 41, 21, 47, 47, 9, 29, 54, 21, 47, 25, 39, 23, 41, 31, 58, 41, 50, 47, 56, 29, 45, 45, 37, 32, 63, 36, 57, 45, 41, 73, 55, 65, 53, 73, 46, 53, 76, 53, 37, 67, 21, 38, 46, 57, 48, 53, 32, 50, 21, 74, 55, 79, 55, 70, 51, 64, 73, 67, 63, 83, 68, 77, 71, 79, 63, 80, 81, 83, 83, 93, 91, 95, 98, 93, 106, 99, 108, 107, 92, 112] 0

k\_1000 139

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j12022\_9.sm case j12022\_9.sm

40 729.5503122806549 s [119, 154] 9.174311926605505 [0, 0, 0, 0, 10, 7, 21, 33, 14, 23, 24, 8, 8, 24, 10, 30, 7, 33, 34, 20, 11, 27, 30, 21, 14, 24, 45, 13, 21, 14, 13, 10, 23, 9, 26, 14, 23, 24, 20, 7, 26, 53, 39, 14, 38, 37, 23, 27, 36, 34, 38, 53, 31, 36, 44, 46, 74, 38, 23, 46, 9, 40, 33, 41, 74, 16, 54, 82, 34, 57, 47, 65, 49, 40, 46, 39, 40, 89, 79, 62, 82, 43, 51, 31, 62, 43, 54, 44, 65, 48, 89, 74, 57, 95, 58, 51, 54, 77, 59, 72, 53, 63, 73, 82, 67, 49, 87, 87, 94, 78, 97, 87, 105, 93, 105, 89, 95, 99, 97, 109, 114, 119] 0

k\_1000 140

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_1.sm case j12023\_1.sm

20 182.2709186077118 s [107, 111] 0.0 [0, 0, 0, 0, 4, 4, 4, 8, 16, 8, 5, 11, 2, 10, 2, 6, 16, 8, 21, 5, 15, 17, 16, 25, 2, 25, 10, 20, 48, 16, 21, 22, 13, 26, 20, 12, 13, 16, 25, 28, 26, 32, 21, 30, 15, 19, 40, 26, 25, 39, 36, 26, 34, 34, 36, 26, 32, 44, 46, 28, 52, 32, 35, 40, 15, 34, 39, 36, 53, 43, 54, 26, 47, 61, 6, 26, 3, 55, 45, 58, 38, 43, 45, 50, 41, 44, 55, 53, 32, 55, 71, 38, 59, 49, 59, 41, 72, 44, 59, 61, 67, 69, 71, 55, 60, 76, 67, 81, 74, 69, 46, 89, 73, 76, 63, 92, 81, 36, 101, 85, 101, 107] 0

k\_1000 141

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_10.sm case j12023\_10.sm

14 118.63325071334839 s [100, 132] 0.0 [0, 0, 0, 0, 6, 12, 18, 18, 19, 12, 6, 10, 4, 6, 20, 47, 20, 19, 19, 20, 18, 19, 19, 10, 30, 28, 29, 28, 10, 27, 37, 14, 16, 27, 14, 44, 19, 32, 38, 51, 31, 36, 28, 37, 48, 36, 4, 28, 27, 44, 27, 16, 31, 44, 36, 19, 20, 32, 29, 48, 42, 29, 37, 39, 37, 33, 30, 55, 40, 20, 38, 56, 34, 44, 44, 44, 53, 20, 59, 44, 39, 25, 49, 63, 49, 64, 44, 69, 51, 54, 51, 50, 45, 62, 53, 55, 60, 54, 61, 63, 49, 63, 68, 60, 72, 64, 64, 71, 81, 71, 80, 70, 75, 79, 73, 85, 89, 74, 75, 91, 90, 100] 0

k\_1000 142

opm 116

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_2.sm case j12023\_2.sm

20 197.719872713089 s [116, 251] 0.0 [0, 0, 0, 0, 4, 6, 10, 16, 10, 4, 16, 4, 19, 25, 34, 3, 16, 10, 19, 11, 24, 24, 25, 25, 14, 35, 27, 25, 48, 35, 3, 9, 27, 11, 49, 41, 26, 41, 43, 34, 35, 40, 35, 6, 27, 17, 21, 3, 41, 21, 52, 27, 71, 24, 28, 53, 47, 47, 46, 57, 40, 33, 34, 21, 52, 16, 33, 8, 33, 34, 37, 43, 43, 42, 47, 45, 49, 66, 36, 53, 36, 61, 62, 66, 39, 46, 66, 61, 91, 69, 62, 53, 69, 48, 53, 25, 69, 71, 81, 74, 91, 45, 53, 74, 75, 71, 62, 76, 86, 77, 75, 89, 91, 52, 84, 101, 93, 101, 92, 89, 111, 116] 0

k\_1000 143

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_3.sm case j12023\_3.sm

4 21.29894733428955 s [99, 179] 0.0 [0, 0, 0, 0, 7, 3, 12, 4, 4, 12, 8, 7, 4, 20, 20, 7, 14, 14, 17, 14, 7, 27, 17, 29, 35, 29, 4, 17, 15, 18, 7, 19, 27, 25, 33, 28, 35, 23, 21, 40, 40, 8, 33, 5, 28, 46, 17, 17, 19, 48, 35, 29, 42, 28, 41, 23, 35, 35, 20, 27, 4, 34, 35, 25, 14, 51, 33, 35, 55, 27, 42, 43, 29, 50, 59, 36, 19, 12, 44, 53, 38, 23, 35, 55, 59, 38, 50, 51, 55, 54, 63, 40, 55, 38, 55, 40, 65, 62, 53, 67, 67, 76, 67, 60, 75, 77, 35, 63, 67, 56, 48, 70, 77, 43, 39, 77, 81, 82, 83, 92, 72, 99] 0

k\_1000 144

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_4.sm case j12023\_4.sm

56 716.4892227649689 s [107, 145] 0.9433962264150944 [0, 0, 0, 0, 8, 6, 6, 5, 17, 8, 12, 8, 14, 8, 16, 16, 16, 16, 24, 16, 21, 8, 24, 27, 33, 8, 13, 33, 16, 29, 27, 13, 14, 42, 33, 30, 36, 43, 52, 36, 16, 24, 12, 38, 43, 14, 46, 18, 30, 52, 53, 36, 43, 39, 49, 49, 59, 42, 43, 49, 58, 61, 17, 5, 71, 45, 56, 43, 29, 13, 58, 55, 58, 67, 9, 45, 68, 24, 58, 76, 35, 67, 56, 67, 55, 58, 34, 71, 76, 59, 81, 68, 75, 73, 56, 78, 28, 68, 53, 60, 67, 70, 76, 79, 79, 83, 82, 81, 84, 86, 90, 71, 89, 84, 82, 91, 97, 90, 101, 89, 90, 107] 0

k\_1000 145

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_5.sm case j12023\_5.sm

54 480.6963405609131 s [99, 115] 0.0 [0, 0, 0, 0, 9, 7, 9, 9, 6, 10, 13, 15, 26, 15, 6, 16, 22, 27, 26, 22, 22, 10, 43, 14, 10, 26, 14, 31, 14, 33, 15, 53, 9, 17, 31, 16, 31, 19, 40, 15, 27, 36, 20, 31, 36, 28, 27, 38, 42, 44, 20, 20, 20, 36, 19, 36, 49, 20, 36, 31, 56, 44, 17, 33, 7, 40, 31, 61, 41, 42, 51, 45, 58, 22, 49, 62, 54, 63, 41, 45, 56, 34, 45, 44, 66, 63, 54, 50, 52, 44, 49, 54, 43, 18, 50, 64, 58, 68, 62, 71, 77, 60, 72, 71, 68, 54, 77, 67, 74, 61, 68, 72, 76, 85, 82, 72, 83, 87, 94, 75, 91, 99] 0

k\_1000 146

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_6.sm case j12023\_6.sm

49 713.5187466144562 s [109, 161] 2.8301886792452833 [0, 0, 0, 0, 5, 5, 10, 10, 19, 10, 19, 19, 24, 24, 24, 6, 16, 14, 35, 22, 19, 28, 25, 14, 25, 42, 5, 10, 28, 28, 19, 13, 31, 31, 19, 30, 64, 29, 28, 14, 19, 28, 14, 34, 38, 30, 29, 35, 40, 31, 32, 40, 34, 51, 20, 40, 34, 39, 48, 34, 38, 16, 34, 30, 22, 71, 8, 38, 29, 44, 45, 57, 42, 40, 51, 46, 48, 43, 57, 49, 56, 46, 35, 66, 48, 49, 54, 54, 69, 37, 55, 36, 60, 39, 40, 67, 61, 69, 69, 67, 80, 44, 78, 74, 83, 85, 59, 81, 63, 84, 83, 67, 74, 92, 83, 87, 93, 92, 83, 100, 73, 109] 0

k\_1000 147

opm 104

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_7.sm case j12023\_7.sm

36 401.92070150375366 s [104, 129] 0.0 [0, 0, 0, 0, 5, 10, 10, 14, 13, 22, 16, 12, 13, 18, 20, 10, 22, 5, 22, 28, 12, 25, 14, 1, 13, 28, 13, 5, 41, 8, 46, 27, 37, 23, 17, 36, 28, 16, 20, 4, 20, 14, 21, 18, 8, 34, 27, 32, 25, 34, 34, 18, 44, 9, 37, 56, 37, 51, 34, 22, 30, 13, 35, 54, 27, 8, 51, 27, 17, 20, 58, 36, 39, 27, 25, 44, 51, 39, 57, 44, 35, 48, 40, 36, 47, 54, 59, 38, 58, 41, 46, 58, 61, 54, 44, 62, 44, 46, 66, 56, 66, 66, 54, 54, 66, 62, 69, 68, 75, 62, 46, 64, 67, 85, 68, 75, 85, 93, 68, 75, 97, 104] 0

k\_1000 148

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_8.sm case j12023\_8.sm

22 230.6590976715088 s [101, 141] 0.0 [0, 0, 0, 0, 2, 2, 2, 3, 10, 13, 7, 13, 13, 10, 28, 9, 20, 9, 18, 8, 20, 28, 9, 9, 19, 18, 10, 26, 22, 28, 24, 10, 31, 19, 20, 14, 3, 31, 26, 37, 16, 31, 14, 37, 9, 24, 10, 24, 34, 25, 9, 29, 29, 46, 29, 27, 42, 18, 55, 22, 36, 10, 28, 31, 39, 48, 43, 56, 50, 21, 35, 33, 55, 42, 24, 46, 27, 46, 16, 28, 64, 41, 65, 42, 56, 65, 49, 20, 31, 59, 13, 70, 55, 65, 36, 67, 79, 50, 65, 59, 25, 55, 79, 56, 48, 74, 64, 80, 54, 78, 78, 75, 82, 81, 81, 80, 74, 88, 89, 94, 84, 101] 0

k\_1000 149

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12023\_9.sm case j12023\_9.sm

53 709.1658668518066 s [108, 190] 0.9345794392523363 [0, 0, 9, 0, 6, 9, 9, 16, 19, 27, 12, 6, 29, 11, 18, 9, 20, 6, 22, 20, 34, 12, 34, 13, 23, 42, 17, 18, 32, 29, 32, 22, 19, 29, 44, 12, 22, 55, 29, 48, 32, 18, 29, 29, 23, 36, 23, 31, 36, 22, 18, 27, 38, 32, 37, 34, 51, 24, 36, 11, 61, 39, 43, 44, 36, 53, 55, 29, 38, 53, 23, 27, 20, 34, 29, 68, 65, 72, 41, 48, 60, 61, 67, 53, 37, 68, 74, 65, 37, 74, 71, 29, 76, 69, 74, 80, 79, 82, 74, 69, 67, 77, 79, 88, 88, 42, 97, 29, 39, 83, 84, 84, 97, 83, 85, 91, 88, 99, 99, 98, 104, 108] 0

k\_1000 150

opm 93

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_1.sm case j12024\_1.sm

17 141.93450713157654 s [93, 101] 0.0 [0, 0, 0, 0, 1, 1, 4, 4, 14, 10, 10, 1, 6, 11, 11, 6, 9, 11, 9, 13, 7, 9, 16, 9, 15, 7, 16, 6, 15, 11, 17, 11, 25, 15, 20, 25, 15, 15, 42, 27, 17, 24, 29, 20, 11, 20, 12, 29, 11, 44, 16, 41, 29, 32, 39, 27, 11, 23, 32, 27, 38, 41, 16, 42, 41, 24, 28, 17, 16, 51, 25, 47, 16, 29, 27, 28, 50, 29, 35, 30, 25, 32, 47, 51, 27, 44, 39, 49, 24, 34, 59, 54, 51, 34, 48, 32, 54, 45, 68, 48, 53, 53, 57, 60, 44, 63, 69, 76, 48, 68, 29, 70, 71, 78, 85, 72, 86, 48, 87, 56, 50, 93] 0

k\_1000 151

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_10.sm case j12024\_10.sm

45 724.1663422584534 s [92, 96] 1.098901098901099 [0, 0, 0, 0, 10, 5, 10, 10, 5, 15, 10, 8, 21, 15, 23, 5, 21, 31, 6, 5, 15, 14, 32, 23, 30, 8, 21, 52, 25, 32, 19, 17, 26, 40, 32, 23, 31, 33, 32, 15, 39, 31, 40, 18, 15, 25, 48, 32, 19, 22, 57, 33, 15, 38, 39, 40, 57, 17, 22, 22, 58, 8, 39, 25, 57, 58, 37, 25, 10, 49, 43, 45, 38, 14, 42, 40, 68, 32, 58, 54, 45, 37, 23, 68, 62, 73, 60, 64, 36, 35, 25, 42, 39, 45, 67, 60, 37, 67, 66, 72, 54, 76, 76, 77, 40, 52, 78, 59, 76, 66, 78, 85, 73, 71, 84, 45, 84, 86, 86, 90, 87, 92] 0

k\_1000 152

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_2.sm case j12024\_2.sm

59 721.3959112167358 s [94, 94] 3.296703296703297 [0, 0, 0, 0, 7, 10, 1, 7, 16, 21, 22, 10, 7, 11, 17, 27, 21, 27, 17, 26, 1, 16, 10, 9, 27, 37, 19, 17, 28, 29, 16, 32, 37, 26, 37, 41, 26, 22, 42, 28, 9, 33, 11, 12, 44, 44, 27, 22, 38, 7, 28, 27, 33, 33, 41, 41, 35, 9, 35, 45, 12, 32, 26, 27, 48, 48, 47, 49, 41, 24, 54, 49, 42, 50, 37, 51, 43, 18, 55, 42, 50, 49, 51, 58, 56, 64, 52, 58, 64, 73, 68, 56, 75, 57, 65, 68, 66, 55, 24, 69, 63, 66, 70, 76, 66, 71, 78, 69, 73, 75, 78, 78, 76, 80, 83, 76, 88, 81, 89, 92, 83, 94] 0

k\_1000 153

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_3.sm case j12024\_3.sm

14 81.25918173789978 s [89, 94] 0.0 [0, 0, 0, 0, 9, 10, 5, 17, 9, 9, 9, 10, 20, 27, 17, 20, 9, 14, 12, 19, 14, 24, 10, 28, 22, 21, 38, 16, 31, 10, 31, 16, 30, 20, 17, 29, 24, 27, 34, 38, 24, 20, 32, 24, 31, 20, 38, 37, 36, 22, 34, 47, 20, 37, 27, 42, 35, 41, 12, 28, 37, 28, 35, 35, 37, 28, 30, 41, 46, 38, 43, 50, 47, 30, 46, 34, 36, 54, 24, 47, 47, 47, 45, 36, 29, 34, 35, 47, 53, 53, 50, 54, 53, 55, 54, 60, 60, 62, 66, 51, 53, 60, 62, 60, 66, 30, 60, 69, 40, 61, 63, 64, 76, 84, 68, 66, 60, 76, 83, 87, 74, 89] 0

k\_1000 154

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_4.sm case j12024\_4.sm

14 128.02160954475403 s [101, 104] 0.0 [0, 0, 0, 0, 8, 9, 7, 9, 11, 7, 20, 16, 8, 20, 16, 26, 9, 23, 28, 16, 32, 11, 21, 8, 32, 23, 34, 9, 36, 12, 24, 27, 30, 24, 30, 24, 38, 30, 20, 36, 34, 26, 30, 28, 20, 37, 32, 39, 45, 24, 38, 30, 11, 12, 12, 39, 58, 29, 31, 36, 45, 38, 41, 46, 27, 37, 32, 41, 47, 47, 47, 55, 35, 47, 34, 35, 57, 34, 50, 32, 47, 41, 40, 15, 50, 64, 57, 47, 57, 46, 66, 38, 57, 51, 50, 42, 33, 41, 66, 65, 81, 62, 72, 79, 65, 47, 47, 66, 55, 61, 76, 85, 90, 96, 91, 66, 85, 89, 98, 94, 72, 101] 0

k\_1000 155

opm 86

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_5.sm case j12024\_5.sm

59 725.604398727417 s [89, 91] 3.488372093023256 [0, 0, 0, 0, 9, 16, 3, 16, 3, 17, 9, 20, 1, 9, 20, 9, 16, 5, 9, 20, 22, 20, 5, 4, 16, 15, 26, 25, 15, 7, 25, 25, 35, 16, 22, 44, 20, 5, 19, 20, 27, 4, 21, 17, 44, 21, 39, 29, 16, 25, 35, 39, 46, 28, 55, 47, 44, 31, 22, 43, 25, 39, 11, 28, 51, 29, 60, 51, 37, 35, 60, 26, 34, 51, 31, 37, 62, 48, 31, 54, 40, 49, 29, 66, 38, 43, 62, 51, 58, 53, 17, 39, 44, 55, 49, 55, 48, 60, 53, 53, 66, 44, 73, 58, 64, 76, 63, 76, 55, 66, 46, 76, 65, 68, 72, 78, 71, 76, 82, 83, 83, 89] 0

k\_1000 156

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_6.sm case j12024\_6.sm

18 104.95794677734375 s [95, 104] 0.0 [0, 0, 0, 0, 7, 3, 2, 9, 12, 3, 9, 7, 15, 10, 10, 15, 25, 15, 2, 2, 15, 19, 3, 12, 27, 39, 15, 25, 13, 21, 15, 25, 26, 12, 6, 9, 21, 23, 30, 25, 15, 39, 34, 6, 40, 32, 41, 19, 32, 18, 7, 39, 27, 27, 32, 30, 35, 22, 7, 40, 49, 41, 11, 15, 34, 41, 32, 6, 12, 37, 50, 44, 42, 51, 49, 60, 21, 46, 40, 46, 34, 47, 47, 50, 51, 32, 25, 34, 47, 59, 34, 61, 54, 49, 50, 61, 22, 54, 37, 56, 51, 68, 54, 47, 68, 61, 70, 71, 57, 61, 72, 76, 77, 75, 63, 57, 70, 82, 88, 77, 83, 95] 0

k\_1000 157

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_7.sm case j12024\_7.sm

2 19.26440978050232 s [112, 112] 0.0 [0, 0, 0, 0, 8, 8, 17, 24, 2, 11, 14, 2, 24, 8, 8, 2, 17, 8, 26, 24, 33, 22, 26, 12, 13, 26, 30, 40, 17, 11, 22, 13, 11, 22, 20, 20, 33, 15, 35, 32, 35, 39, 42, 14, 25, 30, 33, 40, 24, 39, 26, 35, 24, 29, 46, 45, 43, 32, 54, 40, 12, 22, 50, 47, 39, 46, 51, 40, 42, 35, 48, 64, 43, 54, 45, 69, 45, 22, 39, 45, 48, 73, 22, 51, 53, 60, 53, 66, 49, 73, 34, 20, 48, 60, 57, 42, 53, 53, 62, 66, 81, 69, 67, 62, 28, 66, 73, 77, 88, 62, 75, 75, 57, 82, 84, 93, 101, 92, 111, 82, 102, 112] 0

k\_1000 158

opm 104

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_8.sm case j12024\_8.sm

24 248.01421546936035 s [104, 136] 0.0 [0, 0, 0, 0, 9, 9, 15, 25, 32, 20, 34, 30, 35, 30, 42, 34, 10, 35, 34, 18, 37, 41, 30, 47, 27, 35, 51, 10, 42, 20, 18, 52, 42, 64, 41, 43, 43, 41, 31, 48, 25, 45, 45, 48, 28, 31, 9, 20, 61, 39, 41, 79, 45, 48, 56, 31, 52, 51, 55, 46, 59, 46, 40, 67, 58, 59, 27, 23, 51, 61, 15, 39, 52, 56, 51, 53, 70, 15, 67, 30, 44, 67, 56, 72, 77, 60, 70, 50, 33, 64, 31, 62, 73, 45, 82, 77, 52, 77, 56, 85, 67, 81, 55, 87, 72, 59, 76, 83, 84, 87, 79, 91, 87, 93, 83, 89, 97, 84, 89, 99, 87, 104] 0

k\_1000 159

opm 82

the random choice case path in j120 ./rcpsp/j120.sm/j12024\_9.sm case j12024\_9.sm

33 247.1262230873108 s [82, 117] 0.0 [0, 0, 0, 0, 1, 4, 9, 1, 3, 9, 11, 4, 4, 1, 6, 12, 16, 16, 9, 16, 3, 6, 9, 12, 23, 9, 11, 17, 18, 14, 17, 9, 19, 19, 19, 26, 9, 26, 23, 11, 17, 10, 11, 31, 18, 20, 20, 27, 33, 23, 18, 10, 13, 14, 15, 31, 27, 28, 11, 33, 22, 35, 34, 28, 18, 40, 30, 43, 36, 11, 43, 29, 13, 23, 28, 29, 31, 36, 34, 31, 37, 43, 35, 38, 10, 28, 50, 26, 37, 57, 39, 41, 20, 47, 39, 50, 13, 58, 50, 35, 29, 47, 53, 26, 44, 47, 44, 58, 47, 38, 48, 58, 64, 57, 66, 70, 50, 65, 76, 66, 68, 82] 0

k\_1000 160

opm 82

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_1.sm case j12025\_1.sm

93 722.8263494968414 s [83, 122] 1.2195121951219512 [0, 0, 0, 0, 4, 9, 4, 9, 6, 10, 11, 10, 10, 19, 23, 18, 11, 20, 11, 16, 17, 17, 11, 18, 8, 20, 16, 25, 25, 19, 16, 34, 24, 19, 25, 29, 23, 29, 18, 19, 33, 29, 28, 26, 20, 24, 12, 24, 34, 42, 35, 11, 35, 30, 23, 39, 8, 44, 23, 42, 26, 16, 30, 35, 17, 33, 54, 44, 33, 33, 44, 43, 24, 23, 39, 34, 42, 48, 47, 44, 49, 9, 40, 39, 11, 37, 23, 47, 39, 37, 42, 53, 42, 56, 54, 46, 42, 58, 52, 56, 64, 44, 46, 53, 56, 43, 66, 58, 64, 65, 66, 69, 56, 54, 64, 66, 70, 71, 73, 73, 72, 83] 0

k\_1000 161

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_10.sm case j12025\_10.sm

10 44.3941125869751 s [92, 97] 0.0 [0, 0, 0, 0, 9, 10, 12, 22, 22, 12, 12, 12, 13, 2, 13, 22, 25, 19, 31, 9, 17, 20, 10, 10, 13, 15, 27, 17, 34, 19, 9, 36, 29, 19, 32, 29, 41, 17, 27, 22, 26, 26, 17, 26, 26, 26, 29, 2, 41, 30, 26, 38, 48, 38, 33, 29, 13, 35, 29, 33, 33, 30, 38, 42, 32, 48, 41, 10, 44, 42, 48, 33, 52, 38, 30, 48, 27, 26, 33, 20, 58, 39, 42, 48, 65, 52, 37, 59, 47, 65, 23, 44, 60, 54, 29, 73, 34, 54, 60, 68, 76, 63, 46, 58, 58, 59, 64, 52, 54, 66, 68, 61, 74, 47, 69, 69, 80, 76, 83, 67, 71, 92] 0

k\_1000 162

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_2.sm case j12025\_2.sm

3 19.987664222717285 s [108, 166] 0.0 [0, 0, 0, 0, 7, 7, 8, 7, 12, 15, 22, 19, 19, 8, 22, 12, 24, 15, 19, 24, 22, 24, 12, 22, 11, 8, 26, 27, 14, 4, 27, 27, 34, 31, 36, 33, 22, 34, 17, 34, 7, 26, 27, 35, 31, 41, 41, 47, 8, 50, 40, 32, 20, 39, 36, 42, 41, 27, 26, 32, 11, 17, 23, 39, 11, 39, 46, 36, 32, 41, 51, 51, 41, 7, 51, 43, 14, 47, 55, 52, 35, 47, 52, 58, 52, 48, 51, 55, 55, 52, 35, 55, 61, 40, 46, 40, 39, 65, 67, 57, 72, 13, 62, 72, 53, 68, 51, 58, 54, 82, 64, 90, 64, 60, 72, 62, 63, 94, 79, 69, 100, 108] 0

k\_1000 163

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_3.sm case j12025\_3.sm

1 6.17848801612854 s [100, 116] 0.0 [0, 0, 0, 0, 9, 15, 9, 15, 11, 17, 27, 18, 33, 15, 4, 27, 19, 14, 27, 29, 24, 4, 34, 31, 38, 21, 11, 24, 33, 35, 12, 46, 35, 34, 23, 37, 29, 10, 21, 45, 34, 24, 45, 10, 35, 40, 19, 37, 29, 26, 37, 26, 24, 8, 31, 20, 29, 26, 23, 30, 33, 9, 38, 47, 40, 48, 35, 23, 33, 23, 45, 45, 37, 35, 47, 30, 47, 46, 50, 34, 51, 44, 50, 48, 60, 27, 40, 70, 70, 72, 52, 48, 78, 48, 58, 51, 52, 58, 34, 54, 55, 63, 58, 63, 58, 67, 67, 51, 80, 78, 66, 72, 86, 50, 64, 88, 64, 68, 75, 76, 93, 100] 0

k\_1000 164

opm 117

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_4.sm case j12025\_4.sm

5 25.213517427444458 s [117, 156] 0.0 [0, 0, 0, 0, 9, 2, 18, 9, 9, 2, 9, 9, 17, 17, 17, 9, 20, 18, 9, 27, 27, 28, 4, 28, 36, 20, 31, 17, 39, 7, 19, 30, 2, 7, 7, 20, 19, 31, 29, 39, 12, 39, 36, 39, 31, 29, 18, 49, 20, 12, 27, 49, 24, 42, 57, 30, 40, 19, 39, 65, 34, 24, 49, 31, 39, 57, 39, 29, 30, 46, 47, 57, 30, 57, 50, 16, 62, 66, 33, 69, 47, 62, 39, 25, 66, 44, 25, 71, 71, 44, 57, 45, 54, 53, 71, 45, 54, 74, 46, 66, 81, 66, 76, 57, 82, 83, 53, 88, 78, 78, 85, 89, 85, 96, 104, 70, 83, 110, 92, 89, 116, 117] 0

k\_1000 165

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_5.sm case j12025\_5.sm

0 4.438148260116577 s [100, 159] 0.0 [0, 0, 0, 0, 3, 1, 3, 4, 10, 4, 10, 10, 9, 17, 16, 1, 12, 21, 17, 9, 3, 8, 17, 14, 9, 17, 26, 4, 21, 23, 12, 25, 17, 12, 31, 31, 26, 30, 32, 34, 25, 34, 16, 31, 40, 4, 28, 31, 43, 44, 8, 46, 38, 14, 4, 46, 48, 30, 25, 12, 31, 17, 39, 43, 21, 44, 58, 44, 16, 31, 35, 47, 32, 43, 40, 22, 37, 65, 72, 40, 40, 48, 48, 51, 33, 37, 26, 17, 54, 36, 49, 48, 73, 77, 52, 55, 47, 51, 80, 54, 47, 59, 36, 54, 64, 57, 44, 52, 64, 66, 73, 90, 76, 59, 52, 93, 68, 67, 73, 72, 94, 100] 0

k\_1000 166

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_6.sm case j12025\_6.sm

4 26.044292211532593 s [91, 122] -1.0869565217391304 [0, 0, 0, 0, 8, 8, 4, 8, 8, 4, 9, 17, 12, 4, 7, 12, 18, 8, 17, 18, 26, 23, 30, 18, 12, 30, 8, 23, 37, 19, 26, 9, 36, 30, 17, 7, 37, 16, 40, 20, 13, 23, 9, 36, 23, 14, 32, 24, 29, 30, 26, 39, 42, 42, 41, 32, 42, 47, 47, 19, 37, 35, 23, 46, 8, 35, 48, 25, 41, 37, 27, 56, 20, 39, 42, 25, 57, 50, 40, 34, 56, 47, 32, 53, 30, 61, 53, 7, 41, 47, 41, 57, 62, 51, 52, 44, 56, 58, 54, 69, 63, 60, 68, 69, 63, 71, 62, 66, 71, 54, 77, 69, 55, 81, 73, 78, 59, 84, 87, 82, 75, 91] 0

k\_1000 167

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_7.sm case j12025\_7.sm

58 721.1369788646698 s [94, 106] 2.1739130434782608 [0, 0, 0, 0, 5, 5, 5, 6, 10, 8, 19, 19, 19, 25, 6, 25, 11, 32, 8, 3, 11, 25, 17, 11, 22, 8, 33, 17, 22, 22, 38, 27, 17, 57, 32, 35, 40, 49, 27, 35, 49, 20, 38, 35, 10, 28, 20, 13, 57, 36, 45, 45, 33, 27, 45, 36, 40, 58, 17, 35, 46, 58, 20, 24, 57, 37, 17, 17, 61, 37, 48, 62, 57, 34, 38, 47, 73, 52, 55, 3, 7, 37, 57, 35, 49, 45, 45, 54, 54, 55, 55, 62, 35, 60, 64, 54, 11, 60, 66, 37, 62, 67, 39, 64, 65, 67, 66, 60, 66, 67, 67, 72, 66, 73, 77, 75, 69, 81, 85, 87, 76, 94] 0

k\_1000 168

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_8.sm case j12025\_8.sm

25 172.96988916397095 s [80, 89] 0.0 [0, 0, 0, 0, 9, 3, 9, 3, 7, 6, 3, 3, 13, 5, 18, 12, 6, 16, 6, 18, 13, 24, 16, 24, 21, 13, 3, 9, 12, 21, 14, 18, 18, 27, 27, 24, 14, 7, 13, 18, 23, 23, 36, 23, 6, 27, 7, 32, 17, 33, 33, 7, 25, 22, 27, 22, 37, 30, 33, 12, 21, 30, 36, 40, 25, 40, 27, 41, 40, 31, 43, 41, 18, 47, 51, 37, 36, 27, 41, 18, 43, 51, 36, 52, 47, 55, 37, 27, 40, 43, 50, 45, 59, 45, 48, 45, 66, 54, 62, 52, 37, 47, 51, 47, 60, 52, 66, 59, 59, 52, 66, 70, 52, 61, 68, 61, 60, 71, 66, 76, 67, 80] 0

k\_1000 169

opm 94

the random choice case path in j120 ./rcpsp/j120.sm/j12025\_9.sm case j12025\_9.sm

0 4.394226789474487 s [94, 94] 0.0 [0, 0, 0, 0, 5, 9, 9, 5, 11, 7, 14, 7, 18, 18, 21, 9, 12, 13, 26, 11, 18, 7, 22, 12, 18, 27, 7, 21, 13, 27, 23, 26, 36, 18, 36, 14, 24, 15, 14, 36, 19, 18, 46, 17, 9, 37, 24, 29, 36, 38, 15, 37, 36, 24, 39, 27, 24, 25, 30, 40, 54, 14, 25, 36, 15, 30, 45, 50, 50, 50, 53, 43, 30, 27, 30, 61, 62, 43, 69, 38, 34, 46, 39, 28, 46, 47, 39, 44, 53, 51, 67, 45, 67, 69, 73, 25, 53, 73, 43, 63, 76, 76, 40, 47, 79, 62, 71, 51, 69, 73, 72, 81, 84, 81, 53, 88, 84, 82, 89, 91, 86, 94] 0

k\_1000 170

opm 169

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_1.sm case j12026\_1.sm

11 924.0146248340607 s [204, 338] 20.710059171597635 [0, 0, 0, 0, 7, 15, 20, 7, 9, 29, 24, 5, 14, 9, 17, 9, 20, 5, 30, 37, 13, 20, 41, 23, 44, 34, 29, 13, 13, 61, 54, 5, 79, 37, 32, 96, 34, 47, 42, 61, 41, 56, 42, 69, 104, 62, 69, 106, 57, 66, 71, 37, 30, 69, 47, 59, 30, 69, 46, 73, 32, 57, 75, 104, 87, 113, 104, 96, 114, 78, 73, 79, 41, 71, 61, 77, 139, 92, 105, 120, 78, 74, 88, 106, 120, 135, 112, 157, 129, 128, 141, 124, 120, 112, 141, 126, 167, 150, 113, 170, 120, 135, 157, 120, 139, 138, 133, 165, 175, 140, 174, 140, 170, 193, 184, 183, 195, 174, 190, 199, 176, 204] 0

k\_1000 171

opm 183

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_10.sm case j12026\_10.sm

11 1029.8839898109436 s [216, 270] 18.0327868852459 [0, 10, 17, 0, 16, 10, 20, 10, 28, 18, 16, 20, 19, 17, 19, 38, 18, 27, 19, 21, 21, 21, 35, 28, 61, 21, 104, 31, 31, 27, 39, 44, 35, 37, 122, 71, 76, 29, 52, 85, 21, 39, 113, 28, 124, 77, 77, 46, 38, 88, 51, 52, 23, 82, 94, 45, 43, 51, 37, 61, 121, 61, 45, 70, 29, 74, 72, 90, 85, 45, 132, 70, 91, 20, 74, 50, 85, 49, 68, 127, 121, 43, 35, 113, 67, 130, 137, 127, 143, 57, 61, 132, 153, 89, 135, 74, 122, 160, 160, 90, 153, 143, 145, 170, 180, 76, 127, 121, 139, 168, 193, 200, 170, 184, 193, 201, 130, 175, 185, 196, 206, 216] 0

k\_1000 172

opm 169

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_2.sm case j12026\_2.sm

13 728.2813217639923 s [199, 208] 17.75147928994083 [0, 14, 0, 0, 9, 15, 6, 6, 23, 8, 23, 25, 8, 9, 12, 23, 15, 12, 19, 19, 43, 68, 19, 36, 45, 44, 55, 25, 30, 44, 12, 30, 9, 34, 25, 13, 59, 30, 29, 35, 74, 34, 47, 38, 47, 68, 89, 74, 64, 13, 35, 74, 84, 74, 55, 84, 78, 59, 50, 82, 107, 34, 99, 110, 82, 55, 92, 44, 120, 106, 82, 83, 110, 89, 23, 106, 92, 144, 29, 152, 96, 91, 92, 50, 129, 113, 139, 119, 93, 142, 54, 142, 95, 159, 152, 164, 95, 50, 146, 16, 150, 108, 139, 127, 141, 130, 153, 141, 118, 153, 175, 159, 183, 160, 172, 148, 172, 189, 184, 192, 175, 199] 0

k\_1000 173

opm 167

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_3.sm case j12026\_3.sm

11 897.2770833969116 s [191, 218] 14.37125748502994 [0, 0, 1, 0, 8, 9, 14, 8, 9, 1, 1, 3, 18, 24, 34, 42, 22, 47, 26, 14, 9, 30, 26, 8, 33, 33, 89, 22, 64, 11, 19, 50, 16, 56, 35, 70, 19, 47, 41, 24, 48, 34, 11, 47, 16, 127, 65, 93, 53, 77, 26, 127, 109, 101, 50, 56, 96, 59, 26, 117, 76, 3, 152, 65, 59, 102, 67, 65, 34, 84, 90, 84, 109, 135, 77, 53, 75, 69, 64, 99, 84, 98, 98, 34, 93, 121, 59, 117, 131, 151, 131, 142, 137, 119, 135, 76, 118, 134, 178, 42, 89, 139, 145, 121, 141, 162, 148, 143, 145, 179, 106, 165, 160, 119, 159, 171, 152, 171, 178, 176, 182, 191] 0

k\_1000 174

opm 172

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_4.sm case j12026\_4.sm

11 965.4074110984802 s [219, 789] 27.325581395348834 [0, 0, 0, 0, 7, 7, 6, 7, 67, 7, 5, 19, 5, 10, 7, 36, 42, 86, 52, 87, 26, 27, 10, 26, 102, 96, 87, 17, 39, 31, 17, 105, 52, 47, 76, 26, 17, 115, 79, 38, 57, 81, 111, 42, 33, 96, 115, 57, 33, 103, 26, 32, 7, 79, 95, 83, 65, 117, 96, 115, 85, 57, 68, 57, 105, 10, 71, 117, 45, 17, 79, 104, 40, 131, 58, 127, 16, 111, 135, 116, 140, 136, 127, 71, 147, 145, 147, 147, 115, 76, 87, 119, 154, 156, 159, 147, 164, 165, 149, 161, 155, 175, 172, 165, 173, 131, 184, 184, 161, 189, 173, 194, 192, 198, 200, 172, 208, 210, 189, 184, 212, 219] 0

k\_1000 175

opm 153

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_5.sm case j12026\_5.sm

11 785.6307389736176 s [183, 199] 19.607843137254903 [0, 0, 4, 0, 14, 4, 8, 4, 8, 51, 4, 16, 35, 19, 7, 19, 12, 19, 8, 8, 19, 21, 35, 48, 42, 27, 27, 42, 53, 71, 27, 81, 5, 31, 64, 31, 16, 42, 85, 91, 35, 43, 52, 62, 97, 91, 51, 98, 75, 36, 44, 56, 91, 21, 82, 35, 25, 101, 114, 36, 125, 102, 56, 130, 62, 71, 79, 76, 74, 22, 98, 82, 82, 52, 88, 53, 58, 134, 130, 62, 131, 31, 56, 98, 111, 125, 138, 88, 139, 82, 119, 114, 148, 134, 153, 152, 148, 130, 125, 135, 131, 148, 152, 102, 170, 153, 138, 104, 151, 136, 139, 168, 161, 168, 168, 158, 170, 158, 172, 172, 176, 183] 0

k\_1000 176

opm 187

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_6.sm case j12026\_6.sm

17 710.2979919910431 s [200, 238] 6.951871657754011 [0, 0, 0, 0, 14, 13, 34, 35, 45, 39, 46, 18, 54, 81, 25, 89, 41, 42, 64, 9, 2, 34, 47, 42, 46, 27, 47, 27, 42, 47, 74, 26, 51, 13, 51, 31, 57, 52, 9, 89, 69, 37, 97, 69, 37, 42, 56, 69, 64, 65, 58, 56, 17, 97, 42, 57, 9, 75, 17, 56, 64, 51, 11, 90, 48, 13, 123, 131, 113, 151, 122, 122, 64, 92, 139, 128, 36, 71, 71, 130, 108, 100, 144, 100, 91, 130, 144, 161, 64, 81, 149, 149, 113, 108, 48, 82, 139, 154, 169, 111, 119, 99, 100, 120, 140, 130, 138, 151, 131, 161, 173, 169, 187, 190, 169, 177, 161, 187, 195, 193, 181, 200] 0

k\_1000 177

opm 157

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_7.sm case j12026\_7.sm

11 846.8634111881256 s [176, 542] 12.101910828025478 [0, 0, 0, 5, 8, 13, 4, 17, 5, 5, 15, 19, 29, 15, 56, 13, 41, 25, 13, 39, 17, 51, 26, 70, 21, 31, 28, 38, 26, 8, 62, 84, 39, 79, 15, 81, 46, 8, 71, 39, 63, 26, 84, 62, 17, 36, 63, 50, 99, 81, 89, 46, 47, 104, 104, 71, 91, 71, 72, 76, 50, 99, 134, 63, 18, 17, 75, 104, 123, 108, 107, 40, 27, 116, 126, 57, 110, 31, 71, 56, 117, 89, 109, 118, 62, 125, 38, 114, 143, 127, 118, 154, 89, 108, 134, 127, 107, 114, 109, 98, 109, 152, 133, 126, 133, 149, 143, 152, 160, 140, 159, 133, 143, 161, 143, 146, 154, 109, 170, 166, 164, 176] 0

k\_1000 178

opm 176

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_8.sm case j12026\_8.sm

12 687.9376764297485 s [205, 268] 16.477272727272727 [0, 0, 0, 0, 8, 2, 10, 39, 26, 20, 7, 2, 15, 47, 2, 58, 55, 42, 56, 32, 65, 40, 10, 41, 60, 50, 32, 70, 8, 45, 4, 65, 110, 69, 74, 46, 56, 20, 148, 67, 139, 77, 39, 58, 66, 59, 58, 26, 60, 120, 110, 117, 46, 58, 58, 96, 70, 41, 83, 96, 83, 113, 69, 50, 89, 66, 28, 99, 68, 96, 74, 63, 89, 113, 98, 83, 158, 104, 105, 128, 83, 110, 98, 157, 83, 121, 128, 134, 113, 120, 100, 128, 105, 166, 120, 74, 121, 162, 139, 140, 181, 172, 148, 181, 121, 148, 166, 134, 188, 165, 135, 149, 178, 135, 162, 176, 169, 188, 191, 197, 198, 205] 0

k\_1000 179

opm 172

the random choice case path in j120 ./rcpsp/j120.sm/j12026\_9.sm case j12026\_9.sm

11 918.3768544197083 s [214, 429] 24.418604651162788 [0, 0, 0, 8, 7, 8, 10, 28, 18, 52, 48, 21, 18, 81, 28, 7, 100, 36, 35, 10, 36, 48, 36, 21, 58, 89, 108, 44, 52, 52, 18, 100, 28, 77, 94, 54, 108, 25, 89, 40, 94, 60, 25, 56, 58, 116, 12, 58, 110, 48, 64, 73, 100, 25, 104, 21, 82, 35, 67, 56, 52, 39, 35, 126, 81, 108, 122, 122, 113, 132, 116, 73, 140, 81, 97, 126, 90, 77, 67, 131, 109, 112, 77, 145, 153, 161, 67, 119, 128, 145, 152, 132, 167, 167, 167, 177, 136, 104, 177, 108, 85, 152, 167, 176, 157, 179, 185, 132, 186, 112, 186, 186, 189, 195, 150, 116, 193, 205, 207, 207, 186, 214] 0

k\_1000 180

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_1.sm case j12027\_1.sm

18 744.8287031650543 s [114, 119] 5.555555555555555 [0, 0, 0, 0, 7, 6, 11, 5, 16, 11, 20, 11, 19, 5, 22, 15, 6, 28, 22, 17, 26, 20, 13, 9, 39, 36, 13, 16, 26, 67, 26, 53, 9, 35, 14, 14, 46, 12, 40, 55, 40, 30, 62, 33, 67, 38, 45, 55, 22, 17, 25, 46, 13, 26, 46, 34, 56, 36, 78, 77, 50, 16, 45, 59, 23, 6, 67, 38, 43, 49, 46, 39, 51, 14, 22, 61, 75, 86, 59, 75, 80, 23, 61, 36, 46, 85, 67, 55, 75, 94, 50, 67, 80, 94, 67, 71, 69, 58, 70, 97, 86, 74, 82, 85, 80, 93, 70, 91, 94, 82, 98, 104, 94, 99, 102, 82, 94, 99, 104, 113, 103, 114] 0

k\_1000 181

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_10.sm case j12027\_10.sm

16 714.6451601982117 s [132, 141] 14.782608695652174 [0, 0, 0, 0, 4, 1, 12, 4, 20, 4, 20, 30, 1, 21, 10, 7, 12, 9, 19, 22, 20, 22, 27, 11, 27, 23, 33, 34, 22, 34, 43, 26, 52, 41, 26, 29, 39, 53, 38, 37, 38, 67, 30, 26, 12, 37, 47, 63, 55, 11, 46, 35, 41, 65, 72, 15, 41, 33, 36, 42, 61, 42, 53, 52, 70, 11, 59, 59, 71, 17, 73, 59, 55, 59, 50, 70, 62, 72, 58, 76, 81, 83, 61, 83, 78, 92, 69, 101, 67, 75, 79, 85, 87, 76, 92, 86, 90, 93, 68, 93, 99, 99, 86, 99, 101, 93, 95, 104, 103, 98, 99, 113, 113, 108, 112, 111, 120, 113, 130, 118, 119, 132] 0

k\_1000 182

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_2.sm case j12027\_2.sm

22 724.545979976654 s [134, 145] 16.52173913043478 [0, 0, 0, 0, 9, 22, 9, 20, 9, 30, 38, 45, 19, 45, 9, 1, 13, 12, 19, 22, 40, 45, 1, 57, 49, 67, 67, 50, 50, 32, 53, 16, 1, 50, 61, 16, 54, 10, 17, 18, 63, 71, 61, 12, 10, 63, 54, 38, 18, 27, 22, 32, 23, 57, 75, 40, 77, 80, 40, 19, 70, 82, 79, 61, 82, 41, 77, 70, 30, 53, 41, 63, 79, 82, 86, 89, 85, 32, 104, 15, 68, 77, 85, 86, 80, 94, 102, 91, 48, 109, 85, 110, 102, 117, 76, 80, 68, 97, 118, 97, 97, 104, 92, 110, 94, 119, 102, 110, 117, 118, 117, 126, 120, 118, 126, 118, 121, 129, 124, 130, 133, 134] 0

k\_1000 183

opm 144

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_3.sm case j12027\_3.sm

1 28.94850993156433 s [142, 179] -1.3888888888888888 [0, 0, 0, 0, 10, 9, 6, 10, 20, 15, 29, 16, 16, 24, 36, 21, 30, 38, 38, 39, 8, 40, 36, 8, 45, 26, 21, 39, 19, 10, 19, 46, 50, 38, 48, 65, 50, 54, 39, 65, 30, 59, 74, 56, 65, 74, 29, 34, 59, 13, 26, 9, 50, 24, 49, 65, 55, 73, 31, 74, 45, 38, 84, 65, 17, 24, 48, 73, 65, 92, 97, 73, 19, 79, 56, 45, 103, 65, 65, 73, 81, 92, 30, 90, 98, 34, 89, 48, 69, 81, 95, 69, 58, 97, 24, 103, 105, 89, 85, 105, 112, 89, 105, 81, 111, 112, 103, 122, 108, 120, 112, 127, 122, 125, 105, 116, 122, 128, 134, 132, 132, 142] 0

k\_1000 184

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_4.sm case j12027\_4.sm

28 724.704259634018 s [120, 165] 12.149532710280374 [0, 0, 0, 0, 3, 3, 6, 6, 11, 3, 8, 17, 23, 13, 13, 16, 16, 7, 11, 20, 8, 21, 3, 24, 17, 26, 16, 33, 3, 24, 36, 41, 47, 41, 51, 44, 29, 41, 20, 8, 16, 23, 21, 36, 36, 10, 57, 29, 37, 31, 28, 37, 28, 54, 51, 67, 36, 49, 49, 54, 51, 31, 57, 78, 36, 33, 71, 34, 52, 43, 49, 63, 44, 80, 74, 59, 54, 57, 65, 70, 38, 52, 59, 63, 71, 66, 95, 79, 91, 67, 75, 78, 59, 66, 56, 79, 80, 82, 91, 98, 102, 71, 63, 44, 80, 96, 109, 89, 91, 96, 98, 87, 89, 95, 101, 102, 106, 109, 112, 113, 117, 120] 0

k\_1000 185

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_5.sm case j12027\_5.sm

27 728.1369235515594 s [124, 169] 11.711711711711711 [0, 0, 0, 0, 10, 3, 13, 3, 19, 12, 13, 20, 32, 22, 20, 23, 36, 37, 16, 31, 15, 12, 38, 20, 31, 17, 23, 17, 64, 38, 31, 7, 30, 16, 32, 33, 39, 56, 41, 66, 15, 43, 50, 44, 30, 33, 10, 36, 24, 31, 39, 56, 50, 50, 77, 50, 60, 72, 39, 55, 47, 38, 38, 33, 50, 79, 56, 60, 37, 44, 66, 76, 96, 105, 82, 72, 51, 68, 55, 58, 99, 42, 58, 68, 86, 100, 39, 68, 73, 82, 92, 79, 77, 86, 101, 72, 90, 98, 107, 93, 91, 96, 60, 103, 99, 81, 87, 107, 105, 108, 110, 110, 110, 112, 107, 114, 117, 111, 111, 119, 106, 124] 0

k\_1000 186

opm 145

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_6.sm case j12027\_6.sm

12 721.5400660037994 s [173, 224] 19.310344827586206 [0, 0, 0, 0, 1, 2, 2, 11, 20, 2, 1, 51, 21, 7, 29, 6, 29, 52, 29, 8, 52, 37, 85, 61, 26, 57, 51, 59, 29, 21, 7, 58, 35, 61, 11, 61, 91, 67, 7, 66, 77, 20, 77, 28, 30, 44, 47, 59, 67, 30, 77, 85, 69, 87, 76, 83, 115, 47, 67, 75, 92, 84, 120, 59, 103, 87, 78, 85, 106, 69, 78, 52, 132, 97, 81, 66, 108, 99, 91, 99, 116, 109, 116, 111, 123, 133, 115, 129, 141, 79, 30, 112, 116, 109, 118, 125, 136, 103, 141, 111, 95, 103, 129, 83, 95, 103, 125, 135, 147, 135, 121, 149, 149, 123, 144, 155, 144, 153, 135, 163, 147, 173] 0

k\_1000 187

opm 125

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_7.sm case j12027\_7.sm

21 708.1063711643219 s [145, 158] 16.0 [0, 0, 0, 0, 18, 25, 5, 8, 10, 21, 11, 22, 24, 33, 10, 38, 34, 42, 14, 20, 8, 42, 24, 24, 52, 39, 53, 9, 80, 11, 33, 21, 33, 22, 52, 37, 63, 37, 46, 38, 24, 28, 67, 37, 14, 62, 33, 37, 34, 28, 29, 51, 43, 68, 49, 24, 62, 73, 36, 79, 43, 46, 87, 36, 46, 80, 56, 61, 83, 60, 55, 9, 64, 60, 63, 52, 52, 68, 89, 30, 56, 69, 62, 74, 92, 86, 68, 79, 74, 61, 79, 80, 42, 97, 84, 72, 95, 99, 103, 89, 127, 72, 92, 49, 72, 93, 105, 92, 78, 118, 108, 118, 124, 97, 131, 131, 118, 136, 93, 137, 134, 145] 0

k\_1000 188

opm 140

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_8.sm case j12027\_8.sm

17 737.4890220165253 s [150, 1016] 7.142857142857142 [0, 0, 0, 0, 10, 6, 28, 13, 13, 6, 16, 37, 22, 6, 46, 12, 3, 9, 53, 53, 29, 5, 10, 22, 14, 56, 28, 33, 60, 5, 54, 63, 22, 19, 57, 85, 22, 110, 61, 46, 16, 30, 72, 60, 39, 83, 108, 66, 57, 48, 68, 66, 60, 22, 46, 89, 9, 58, 65, 89, 43, 27, 85, 37, 98, 49, 60, 68, 20, 49, 52, 62, 57, 63, 68, 74, 29, 87, 78, 81, 100, 89, 83, 92, 78, 78, 101, 92, 58, 92, 101, 112, 70, 116, 101, 95, 107, 125, 101, 117, 107, 100, 114, 107, 111, 33, 120, 126, 128, 118, 126, 86, 125, 127, 135, 133, 143, 142, 148, 118, 147, 150] 0

k\_1000 189

opm 127

the random choice case path in j120 ./rcpsp/j120.sm/j12027\_9.sm case j12027\_9.sm

19 727.214417219162 s [143, 166] 12.598425196850393 [0, 0, 0, 0, 2, 9, 9, 8, 16, 2, 21, 8, 8, 21, 28, 14, 2, 32, 12, 18, 9, 41, 17, 14, 6, 12, 18, 40, 21, 16, 21, 36, 34, 41, 18, 46, 47, 36, 16, 46, 25, 31, 24, 12, 25, 27, 26, 58, 69, 25, 48, 46, 56, 64, 54, 68, 26, 36, 48, 81, 64, 83, 78, 87, 64, 31, 64, 58, 98, 74, 54, 28, 92, 87, 78, 94, 92, 33, 81, 102, 31, 93, 58, 84, 64, 33, 108, 62, 107, 117, 102, 94, 102, 62, 107, 102, 108, 109, 92, 114, 118, 118, 111, 86, 113, 127, 83, 123, 119, 109, 111, 127, 119, 89, 123, 132, 126, 127, 136, 132, 131, 143] 0

k\_1000 190

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_1.sm case j12028\_1.sm

28 738.6629109382629 s [123, 146] 13.88888888888889 [0, 0, 0, 0, 10, 10, 9, 45, 8, 51, 9, 11, 10, 9, 17, 36, 53, 17, 30, 22, 8, 22, 61, 27, 10, 32, 25, 46, 51, 19, 27, 45, 41, 46, 36, 16, 73, 22, 53, 29, 36, 66, 45, 61, 17, 11, 16, 67, 55, 61, 36, 19, 20, 80, 21, 46, 37, 74, 41, 38, 30, 71, 55, 62, 45, 38, 44, 45, 61, 51, 61, 70, 78, 90, 100, 74, 45, 48, 63, 62, 59, 84, 80, 74, 54, 84, 44, 61, 46, 83, 80, 90, 86, 58, 85, 69, 88, 94, 87, 80, 99, 90, 83, 103, 90, 90, 67, 103, 95, 93, 104, 100, 99, 110, 100, 110, 112, 116, 118, 115, 115, 123] 0

k\_1000 191

opm 116

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_10.sm case j12028\_10.sm

32 709.3075392246246 s [123, 133] 6.0344827586206895 [0, 0, 0, 0, 8, 1, 8, 8, 8, 17, 17, 20, 27, 18, 33, 12, 27, 15, 37, 20, 8, 37, 60, 23, 1, 37, 23, 1, 31, 37, 31, 28, 42, 65, 20, 15, 13, 60, 39, 30, 33, 47, 50, 24, 44, 5, 54, 20, 54, 68, 38, 50, 43, 75, 59, 28, 55, 6, 59, 73, 31, 65, 68, 61, 59, 54, 60, 54, 32, 32, 89, 43, 65, 51, 24, 64, 55, 59, 83, 80, 62, 68, 33, 79, 17, 75, 83, 91, 96, 70, 73, 83, 74, 74, 70, 81, 89, 59, 82, 83, 83, 105, 90, 90, 91, 89, 83, 91, 91, 96, 94, 104, 97, 113, 103, 97, 105, 92, 116, 113, 104, 123] 0

k\_1000 192

opm 110

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_2.sm case j12028\_2.sm

38 733.5412309169769 s [118, 168] 7.2727272727272725 [0, 0, 0, 0, 5, 5, 10, 14, 21, 14, 24, 16, 16, 23, 5, 8, 24, 14, 23, 39, 23, 27, 8, 16, 37, 26, 20, 36, 33, 33, 47, 18, 43, 52, 44, 24, 47, 39, 51, 23, 13, 61, 24, 20, 43, 43, 18, 8, 48, 43, 44, 25, 33, 39, 41, 48, 52, 44, 36, 56, 56, 70, 52, 27, 55, 54, 13, 55, 65, 65, 39, 10, 52, 45, 75, 65, 45, 55, 46, 44, 63, 52, 70, 80, 56, 72, 72, 73, 74, 33, 81, 83, 51, 51, 63, 48, 77, 52, 90, 74, 80, 76, 95, 48, 87, 84, 95, 101, 91, 105, 88, 93, 90, 98, 91, 103, 103, 84, 110, 107, 110, 118] 0

k\_1000 193

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_3.sm case j12028\_3.sm

42 721.1582071781158 s [111, 180] 9.900990099009901 [0, 0, 0, 0, 6, 18, 47, 9, 10, 6, 13, 9, 11, 29, 20, 19, 14, 20, 40, 13, 48, 11, 18, 13, 19, 18, 29, 28, 35, 27, 9, 19, 21, 29, 28, 38, 9, 31, 21, 12, 36, 36, 38, 13, 16, 38, 16, 20, 10, 27, 31, 38, 41, 48, 47, 21, 35, 50, 30, 31, 48, 50, 43, 39, 50, 28, 51, 72, 52, 36, 56, 57, 56, 12, 40, 43, 26, 47, 57, 59, 32, 51, 57, 65, 62, 58, 55, 28, 65, 67, 82, 57, 57, 68, 67, 62, 60, 50, 84, 69, 62, 82, 70, 67, 71, 54, 77, 66, 87, 62, 74, 63, 72, 79, 92, 78, 94, 98, 88, 105, 104, 111] 0

k\_1000 194

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_4.sm case j12028\_4.sm

24 738.8510942459106 s [131, 204] 16.964285714285715 [0, 0, 0, 0, 10, 5, 5, 19, 1, 13, 19, 5, 23, 26, 6, 11, 5, 1, 49, 14, 49, 6, 1, 16, 16, 6, 13, 3, 16, 41, 35, 27, 41, 49, 56, 29, 24, 35, 26, 13, 24, 5, 84, 29, 59, 62, 56, 60, 18, 65, 21, 38, 31, 80, 66, 17, 71, 45, 27, 38, 74, 66, 34, 77, 20, 71, 62, 65, 9, 27, 62, 37, 68, 56, 78, 45, 62, 95, 73, 80, 51, 80, 90, 66, 82, 78, 60, 51, 101, 65, 73, 84, 90, 17, 101, 110, 76, 65, 80, 92, 97, 83, 102, 80, 105, 100, 90, 74, 106, 98, 90, 97, 35, 92, 106, 105, 112, 115, 121, 76, 123, 131] 0

k\_1000 195

opm 102

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_5.sm case j12028\_5.sm

39 728.4523448944092 s [105, 200] 2.941176470588235 [0, 0, 0, 0, 4, 4, 10, 4, 4, 13, 17, 10, 16, 14, 22, 4, 23, 18, 17, 13, 17, 26, 7, 34, 14, 23, 10, 54, 17, 22, 32, 21, 41, 41, 13, 47, 31, 35, 9, 31, 22, 37, 21, 37, 54, 41, 35, 42, 42, 18, 18, 31, 44, 26, 15, 35, 21, 49, 50, 26, 54, 64, 62, 21, 72, 72, 67, 35, 28, 54, 82, 64, 60, 48, 42, 45, 50, 72, 70, 37, 35, 58, 4, 45, 64, 54, 45, 77, 63, 40, 53, 73, 53, 72, 42, 58, 87, 61, 63, 58, 72, 62, 67, 77, 86, 59, 70, 80, 82, 76, 90, 91, 88, 94, 73, 79, 87, 94, 85, 97, 97, 105] 0

k\_1000 196

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_6.sm case j12028\_6.sm

25 721.5536684989929 s [120, 160] 16.50485436893204 [0, 0, 0, 0, 6, 6, 11, 6, 16, 11, 15, 6, 16, 6, 20, 21, 17, 10, 24, 27, 10, 10, 27, 22, 20, 31, 22, 14, 16, 11, 20, 35, 23, 15, 26, 27, 27, 35, 30, 17, 17, 40, 44, 43, 52, 35, 23, 29, 37, 6, 29, 24, 43, 32, 14, 44, 44, 37, 68, 32, 61, 50, 79, 42, 40, 54, 10, 77, 55, 87, 36, 31, 54, 51, 65, 55, 43, 77, 61, 42, 67, 70, 69, 63, 82, 72, 45, 61, 78, 67, 81, 59, 79, 57, 88, 93, 78, 67, 97, 81, 88, 88, 88, 100, 99, 100, 69, 97, 97, 104, 87, 110, 101, 95, 94, 104, 99, 112, 117, 117, 108, 120] 0

k\_1000 197

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_7.sm case j12028\_7.sm

23 714.0569622516632 s [120, 233] 10.091743119266056 [0, 0, 0, 0, 6, 7, 2, 2, 28, 2, 8, 19, 6, 16, 24, 12, 48, 20, 8, 9, 9, 11, 25, 53, 7, 19, 10, 26, 26, 19, 21, 30, 19, 38, 24, 31, 9, 19, 71, 42, 52, 86, 7, 22, 12, 31, 41, 9, 33, 48, 38, 44, 12, 21, 47, 47, 14, 12, 53, 55, 15, 58, 50, 14, 44, 35, 56, 24, 35, 56, 14, 46, 34, 57, 57, 68, 26, 79, 48, 64, 54, 76, 36, 59, 56, 56, 89, 69, 57, 86, 66, 64, 92, 31, 73, 93, 64, 69, 73, 71, 66, 79, 79, 80, 64, 84, 79, 84, 42, 92, 98, 90, 101, 108, 103, 99, 105, 114, 115, 115, 112, 120] 0

k\_1000 198

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_8.sm case j12028\_8.sm

36 727.0734527111053 s [114, 183] 15.151515151515152 [0, 0, 0, 0, 5, 8, 11, 13, 6, 23, 8, 16, 24, 23, 5, 15, 6, 20, 29, 29, 25, 20, 9, 15, 18, 35, 33, 10, 29, 35, 13, 13, 40, 48, 47, 16, 60, 33, 70, 9, 49, 52, 39, 21, 33, 37, 15, 62, 24, 70, 20, 26, 22, 48, 28, 39, 25, 46, 38, 26, 26, 37, 44, 46, 47, 25, 34, 52, 43, 41, 29, 47, 65, 49, 20, 38, 54, 73, 56, 72, 46, 64, 56, 54, 48, 55, 59, 60, 70, 73, 70, 32, 72, 34, 32, 82, 67, 62, 85, 94, 65, 5, 87, 85, 71, 82, 94, 81, 81, 96, 95, 48, 99, 96, 71, 103, 87, 93, 104, 103, 104, 114] 0

k\_1000 199

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12028\_9.sm case j12028\_9.sm

29 729.5167129039764 s [105, 105] 7.142857142857142 [0, 0, 0, 0, 1, 1, 1, 1, 10, 1, 3, 11, 13, 7, 17, 3, 7, 5, 1, 2, 14, 11, 5, 22, 24, 7, 30, 24, 6, 20, 5, 17, 11, 22, 30, 13, 41, 22, 27, 12, 19, 21, 31, 20, 15, 21, 12, 27, 24, 37, 50, 7, 33, 24, 39, 35, 29, 27, 14, 22, 54, 44, 35, 42, 47, 44, 31, 46, 38, 45, 46, 46, 54, 56, 42, 27, 35, 39, 61, 27, 51, 45, 57, 50, 36, 56, 61, 29, 35, 50, 44, 61, 57, 63, 60, 60, 68, 75, 68, 63, 69, 65, 68, 76, 77, 66, 45, 57, 79, 57, 85, 80, 65, 72, 75, 85, 73, 91, 95, 101, 79, 105] 0

k\_1000 200

opm 104

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_1.sm case j12029\_1.sm

39 704.076936006546 s [110, 164] 5.769230769230769 [0, 0, 0, 0, 1, 6, 7, 8, 8, 6, 1, 11, 5, 1, 21, 7, 11, 17, 16, 8, 12, 25, 22, 6, 11, 13, 17, 13, 17, 21, 11, 23, 24, 15, 13, 25, 25, 28, 30, 15, 12, 16, 11, 14, 33, 26, 45, 47, 28, 17, 32, 28, 15, 37, 23, 29, 28, 63, 46, 23, 28, 15, 20, 28, 45, 26, 50, 38, 46, 27, 30, 38, 20, 41, 32, 34, 32, 45, 40, 52, 23, 38, 55, 43, 38, 57, 52, 50, 47, 63, 41, 51, 64, 58, 64, 58, 56, 53, 68, 76, 65, 62, 70, 79, 55, 89, 62, 79, 67, 87, 90, 91, 70, 73, 64, 90, 96, 79, 97, 95, 105, 110] 0

k\_1000 201

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_10.sm case j12029\_10.sm

22 180.81168389320374 s [96, 100] 0.0 [0, 0, 0, 0, 6, 11, 3, 11, 14, 4, 4, 24, 25, 14, 14, 4, 14, 38, 31, 24, 23, 10, 15, 14, 30, 21, 30, 22, 21, 29, 30, 21, 30, 14, 33, 22, 14, 22, 35, 14, 30, 21, 29, 46, 34, 38, 41, 19, 31, 38, 33, 32, 13, 43, 38, 29, 40, 40, 54, 33, 40, 23, 45, 36, 40, 41, 46, 41, 49, 54, 45, 33, 54, 21, 31, 40, 50, 54, 38, 59, 57, 45, 46, 49, 59, 50, 59, 33, 61, 53, 55, 61, 53, 51, 62, 61, 55, 57, 55, 54, 63, 58, 41, 65, 58, 70, 68, 79, 64, 64, 65, 69, 71, 76, 63, 81, 84, 71, 73, 88, 92, 96] 0

k\_1000 202

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_2.sm case j12029\_2.sm

57 720.1000471115112 s [94, 162] 3.296703296703297 [0, 0, 0, 0, 2, 10, 24, 10, 2, 17, 9, 30, 13, 2, 27, 23, 7, 25, 12, 14, 8, 31, 13, 12, 18, 9, 34, 8, 13, 22, 5, 25, 34, 27, 5, 27, 18, 29, 25, 11, 34, 34, 25, 51, 10, 31, 41, 33, 43, 45, 13, 12, 23, 28, 45, 55, 51, 33, 35, 22, 27, 23, 40, 35, 17, 32, 27, 32, 41, 10, 23, 35, 36, 68, 54, 42, 31, 48, 43, 44, 41, 43, 48, 50, 70, 51, 42, 62, 51, 51, 65, 53, 55, 55, 59, 51, 50, 59, 59, 65, 40, 63, 78, 59, 62, 74, 59, 68, 72, 60, 72, 70, 75, 44, 77, 65, 86, 72, 89, 86, 78, 94] 0

k\_1000 203

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_3.sm case j12029\_3.sm

39 708.7630393505096 s [113, 125] 15.306122448979592 [0, 0, 0, 0, 8, 12, 8, 15, 21, 22, 30, 10, 29, 39, 32, 15, 25, 18, 15, 22, 26, 19, 29, 8, 10, 26, 25, 15, 24, 28, 21, 27, 32, 14, 31, 19, 12, 48, 33, 42, 14, 29, 32, 38, 32, 21, 38, 49, 48, 40, 46, 39, 49, 31, 42, 57, 38, 42, 53, 30, 51, 58, 61, 54, 50, 60, 52, 34, 49, 49, 26, 56, 8, 63, 60, 41, 52, 65, 39, 73, 56, 43, 70, 61, 18, 51, 54, 46, 32, 74, 74, 68, 54, 74, 27, 61, 32, 69, 50, 72, 73, 83, 49, 84, 84, 66, 74, 79, 70, 90, 90, 72, 65, 96, 90, 93, 84, 100, 99, 106, 107, 113] 0

k\_1000 204

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_4.sm case j12029\_4.sm

61 726.9791202545166 s [88, 89] 10.0 [0, 0, 0, 0, 6, 6, 7, 7, 11, 9, 18, 11, 9, 9, 6, 23, 17, 18, 7, 18, 18, 11, 14, 26, 31, 22, 21, 34, 23, 52, 42, 26, 24, 31, 28, 34, 28, 19, 11, 21, 38, 40, 22, 28, 32, 44, 28, 27, 28, 21, 36, 36, 41, 44, 52, 59, 26, 32, 45, 40, 52, 39, 52, 26, 35, 51, 68, 14, 36, 77, 60, 39, 63, 56, 46, 56, 14, 59, 41, 69, 37, 36, 40, 48, 43, 49, 45, 55, 56, 49, 55, 51, 29, 62, 61, 61, 41, 66, 59, 59, 69, 68, 70, 71, 58, 60, 65, 65, 66, 65, 66, 71, 80, 72, 53, 71, 79, 86, 87, 78, 77, 88] 0

k\_1000 205

opm 102

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_5.sm case j12029\_5.sm

39 729.5830602645874 s [108, 114] 5.88235294117647 [0, 0, 0, 0, 6, 7, 7, 6, 6, 10, 15, 14, 19, 12, 14, 16, 20, 37, 22, 19, 19, 10, 7, 31, 22, 37, 12, 20, 22, 20, 22, 34, 10, 26, 46, 34, 31, 42, 34, 27, 16, 43, 43, 27, 12, 27, 37, 20, 43, 10, 27, 15, 45, 52, 43, 43, 54, 27, 37, 45, 51, 20, 20, 48, 47, 56, 52, 37, 12, 52, 48, 63, 66, 33, 66, 63, 51, 58, 69, 19, 53, 49, 71, 69, 60, 56, 55, 63, 60, 55, 57, 64, 62, 60, 67, 72, 83, 76, 57, 70, 57, 66, 78, 82, 42, 69, 80, 86, 66, 75, 75, 80, 78, 83, 83, 86, 95, 92, 99, 102, 92, 108] 0

k\_1000 206

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_6.sm case j12029\_6.sm

41 720.7097117900848 s [97, 119] 7.777777777777778 [0, 0, 0, 0, 9, 8, 20, 22, 9, 9, 14, 8, 2, 27, 14, 16, 18, 22, 14, 19, 14, 4, 30, 24, 22, 8, 27, 12, 16, 33, 10, 27, 10, 20, 30, 17, 32, 30, 23, 17, 4, 32, 22, 34, 11, 27, 41, 34, 6, 9, 34, 37, 16, 20, 41, 35, 25, 32, 18, 54, 41, 30, 32, 43, 44, 47, 27, 43, 39, 49, 53, 54, 28, 47, 28, 46, 53, 41, 55, 44, 48, 56, 39, 56, 65, 42, 34, 63, 54, 53, 67, 44, 54, 64, 63, 61, 58, 64, 69, 70, 79, 60, 46, 72, 82, 54, 75, 68, 72, 68, 74, 82, 70, 86, 70, 78, 78, 85, 91, 90, 92, 97] 0

k\_1000 207

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_7.sm case j12029\_7.sm

24 270.60571241378784 s [97, 133] 0.0 [0, 0, 0, 0, 2, 5, 13, 13, 16, 3, 10, 11, 5, 20, 20, 16, 15, 13, 11, 18, 16, 23, 23, 23, 11, 2, 18, 28, 27, 26, 27, 18, 15, 32, 3, 16, 25, 16, 17, 19, 27, 26, 34, 41, 17, 34, 29, 10, 28, 34, 36, 28, 29, 44, 32, 45, 39, 41, 39, 42, 44, 44, 45, 48, 53, 50, 34, 44, 44, 48, 45, 53, 50, 36, 46, 55, 18, 36, 55, 62, 48, 68, 53, 48, 60, 46, 54, 57, 63, 57, 56, 41, 66, 63, 63, 3, 69, 69, 60, 73, 69, 52, 63, 73, 73, 73, 73, 82, 82, 86, 78, 58, 74, 80, 62, 88, 78, 82, 88, 91, 91, 97] 0

k\_1000 208

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_8.sm case j12029\_8.sm

42 715.2171740531921 s [85, 95] 6.25 [0, 0, 0, 9, 1, 5, 11, 23, 30, 9, 5, 18, 18, 9, 26, 5, 18, 15, 31, 11, 27, 8, 19, 35, 16, 35, 1, 14, 18, 1, 9, 34, 17, 46, 8, 22, 19, 31, 9, 20, 36, 23, 30, 39, 24, 17, 29, 18, 22, 37, 18, 9, 27, 29, 39, 36, 11, 27, 59, 27, 17, 47, 24, 43, 36, 52, 39, 54, 36, 30, 31, 31, 19, 41, 36, 47, 17, 57, 36, 46, 32, 55, 38, 41, 59, 64, 36, 55, 38, 46, 39, 51, 35, 41, 46, 32, 61, 61, 64, 64, 52, 66, 72, 45, 64, 55, 54, 66, 56, 65, 72, 60, 69, 69, 75, 76, 66, 72, 76, 79, 82, 85] 0

k\_1000 209

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j12029\_9.sm case j12029\_9.sm

41 710.8426051139832 s [98, 187] 1.0309278350515463 [0, 0, 0, 0, 4, 10, 20, 15, 11, 4, 20, 10, 15, 4, 21, 10, 11, 21, 6, 11, 21, 16, 38, 23, 22, 23, 23, 15, 11, 16, 21, 38, 16, 10, 17, 29, 23, 38, 21, 18, 25, 37, 31, 18, 28, 25, 23, 33, 26, 28, 28, 20, 16, 26, 25, 46, 33, 41, 37, 35, 41, 45, 38, 47, 49, 48, 42, 44, 49, 28, 8, 15, 59, 54, 49, 44, 54, 35, 55, 57, 47, 64, 50, 67, 21, 55, 73, 50, 62, 59, 70, 68, 53, 24, 64, 66, 64, 50, 68, 57, 33, 54, 70, 78, 58, 75, 77, 73, 80, 83, 76, 80, 84, 60, 38, 85, 82, 83, 88, 89, 91, 98] 0

k\_1000 210

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_1.sm case j1202\_1.sm

20 697.1225392818451 s [94, 99] 8.045977011494253 [0, 0, 0, 0, 1, 1, 11, 1, 10, 13, 11, 30, 1, 7, 12, 22, 9, 26, 13, 9, 11, 12, 26, 23, 36, 1, 12, 23, 20, 10, 15, 11, 30, 20, 12, 31, 31, 14, 19, 12, 37, 16, 6, 11, 15, 23, 15, 5, 13, 29, 20, 46, 33, 14, 33, 14, 31, 7, 34, 15, 5, 38, 19, 20, 53, 41, 20, 39, 23, 16, 37, 28, 7, 33, 28, 43, 39, 19, 36, 29, 15, 43, 9, 50, 31, 34, 48, 49, 53, 39, 51, 61, 58, 45, 46, 69, 69, 63, 55, 50, 49, 72, 20, 45, 57, 52, 58, 52, 66, 53, 58, 78, 69, 62, 69, 71, 80, 83, 84, 50, 87, 94] 0

k\_1000 211

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_10.sm case j1202\_10.sm

24 726.5900192260742 s [112, 204] 16.666666666666664 [0, 0, 0, 0, 4, 6, 14, 15, 12, 8, 22, 14, 14, 28, 20, 4, 14, 34, 20, 20, 40, 22, 32, 47, 43, 5, 28, 20, 7, 6, 8, 40, 38, 7, 40, 20, 29, 45, 15, 10, 29, 57, 21, 12, 22, 61, 32, 29, 20, 29, 17, 47, 28, 41, 41, 29, 38, 53, 30, 50, 58, 57, 77, 63, 33, 35, 35, 20, 40, 32, 50, 21, 10, 7, 26, 46, 35, 43, 25, 19, 43, 15, 47, 61, 53, 61, 22, 61, 51, 33, 61, 53, 36, 73, 17, 58, 65, 43, 33, 40, 86, 69, 66, 65, 54, 41, 72, 74, 69, 68, 57, 74, 77, 92, 93, 81, 86, 94, 102, 103, 73, 112] 0

k\_1000 212

opm 75

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_2.sm case j1202\_2.sm

47 723.5640177726746 s [77, 78] 2.666666666666667 [0, 0, 0, 0, 7, 7, 10, 10, 15, 18, 9, 10, 9, 10, 16, 15, 7, 15, 15, 15, 24, 25, 24, 14, 20, 10, 19, 16, 17, 21, 28, 31, 10, 14, 18, 27, 22, 11, 21, 22, 10, 25, 21, 48, 12, 20, 38, 23, 25, 30, 27, 57, 30, 24, 16, 23, 23, 28, 33, 34, 32, 40, 28, 27, 32, 38, 38, 11, 24, 45, 36, 20, 33, 41, 49, 45, 22, 36, 22, 30, 39, 43, 33, 46, 53, 39, 27, 30, 17, 46, 35, 42, 57, 48, 39, 50, 36, 37, 26, 51, 58, 55, 60, 40, 53, 64, 43, 58, 61, 63, 64, 62, 60, 51, 67, 51, 57, 58, 32, 67, 75, 77] 0

k\_1000 213

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_3.sm case j1202\_3.sm

17 699.0567319393158 s [108, 117] 17.391304347826086 [0, 0, 0, 0, 9, 8, 8, 33, 14, 43, 9, 17, 19, 19, 17, 51, 19, 20, 17, 49, 52, 21, 29, 14, 9, 43, 17, 55, 49, 34, 49, 58, 43, 9, 20, 63, 34, 25, 21, 27, 42, 46, 55, 58, 19, 30, 55, 25, 29, 39, 63, 31, 54, 49, 44, 42, 52, 32, 25, 44, 48, 62, 20, 71, 62, 68, 31, 52, 50, 66, 58, 71, 17, 55, 63, 44, 20, 33, 79, 44, 48, 55, 39, 31, 34, 44, 64, 76, 43, 68, 54, 57, 39, 62, 25, 67, 77, 54, 64, 60, 79, 42, 82, 76, 73, 50, 81, 89, 85, 71, 87, 59, 94, 79, 99, 81, 92, 95, 90, 101, 105, 108] 0

k\_1000 214

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_4.sm case j1202\_4.sm

22 724.9511153697968 s [106, 249] 11.578947368421053 [0, 0, 0, 0, 2, 6, 14, 6, 6, 11, 11, 7, 2, 12, 19, 2, 25, 14, 25, 26, 12, 20, 12, 7, 6, 13, 16, 25, 50, 29, 27, 35, 14, 32, 32, 24, 25, 6, 11, 37, 17, 25, 6, 33, 11, 13, 46, 23, 20, 15, 26, 28, 20, 23, 23, 28, 31, 29, 34, 45, 38, 24, 5, 34, 24, 44, 33, 35, 15, 51, 55, 22, 37, 50, 39, 51, 50, 60, 74, 55, 37, 79, 60, 80, 44, 69, 77, 53, 37, 34, 60, 69, 43, 35, 38, 44, 29, 46, 69, 74, 76, 88, 50, 55, 60, 79, 74, 69, 40, 65, 55, 58, 84, 88, 85, 85, 87, 98, 68, 95, 103, 106] 0

k\_1000 215

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_5.sm case j1202\_5.sm

24 697.360431432724 s [111, 133] 7.766990291262135 [0, 0, 0, 0, 8, 8, 18, 10, 18, 2, 18, 28, 2, 2, 26, 9, 7, 28, 28, 37, 7, 35, 11, 11, 12, 15, 11, 15, 27, 35, 8, 18, 35, 42, 19, 52, 46, 15, 35, 48, 44, 26, 12, 49, 42, 29, 13, 22, 46, 14, 49, 13, 7, 61, 9, 26, 20, 19, 15, 43, 20, 19, 35, 35, 50, 37, 29, 51, 25, 57, 38, 46, 19, 35, 24, 57, 69, 10, 38, 61, 38, 28, 67, 51, 40, 44, 53, 47, 46, 60, 69, 59, 75, 46, 47, 73, 75, 40, 83, 83, 88, 35, 80, 75, 84, 54, 42, 59, 80, 13, 84, 87, 91, 73, 69, 93, 87, 96, 91, 103, 91, 111] 0

k\_1000 216

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_6.sm case j1202\_6.sm

29 714.2238767147064 s [101, 112] 9.782608695652174 [0, 0, 0, 0, 9, 9, 2, 11, 7, 11, 11, 20, 10, 16, 14, 18, 21, 37, 10, 23, 20, 7, 28, 28, 28, 17, 28, 39, 23, 29, 15, 33, 21, 30, 35, 28, 25, 50, 38, 21, 45, 18, 30, 46, 37, 39, 53, 30, 2, 42, 29, 16, 55, 15, 39, 10, 33, 58, 42, 33, 30, 30, 18, 16, 25, 39, 42, 45, 31, 42, 45, 42, 56, 66, 46, 50, 66, 16, 51, 52, 25, 59, 48, 66, 51, 75, 49, 42, 28, 42, 56, 58, 58, 61, 71, 42, 39, 59, 66, 45, 60, 66, 51, 59, 59, 60, 71, 70, 77, 68, 68, 76, 85, 75, 94, 78, 77, 75, 86, 85, 95, 101] 0

k\_1000 217

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_7.sm case j1202\_7.sm

32 705.5907773971558 s [96, 141] 6.666666666666667 [0, 0, 0, 0, 1, 4, 4, 6, 4, 8, 6, 26, 49, 4, 15, 14, 14, 25, 7, 15, 34, 11, 16, 33, 8, 18, 19, 8, 20, 14, 14, 4, 18, 35, 6, 11, 44, 37, 49, 12, 25, 8, 17, 38, 35, 33, 21, 20, 16, 28, 25, 29, 23, 25, 26, 28, 33, 19, 38, 29, 38, 20, 19, 44, 42, 34, 46, 38, 53, 61, 51, 50, 51, 30, 31, 61, 66, 34, 35, 55, 56, 40, 38, 48, 11, 54, 33, 23, 34, 69, 52, 38, 46, 61, 31, 35, 40, 57, 48, 43, 64, 77, 11, 49, 45, 61, 71, 68, 62, 69, 41, 72, 69, 66, 71, 81, 72, 81, 88, 90, 62, 96] 0

k\_1000 218

opm 83

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_8.sm case j1202\_8.sm

29 722.6581897735596 s [91, 112] 9.63855421686747 [0, 0, 0, 0, 2, 2, 2, 10, 6, 5, 9, 7, 16, 16, 10, 37, 11, 17, 24, 16, 20, 20, 25, 8, 8, 14, 26, 19, 9, 9, 33, 12, 18, 20, 26, 33, 14, 39, 12, 23, 43, 11, 30, 45, 46, 19, 18, 37, 5, 37, 25, 26, 23, 38, 27, 13, 17, 6, 46, 27, 40, 14, 34, 12, 16, 48, 42, 25, 40, 30, 28, 19, 37, 72, 29, 26, 47, 31, 54, 14, 81, 14, 31, 44, 17, 56, 32, 27, 58, 56, 22, 14, 37, 23, 54, 52, 48, 37, 57, 56, 45, 26, 37, 27, 56, 55, 58, 55, 66, 70, 66, 63, 72, 77, 56, 64, 65, 80, 90, 70, 57, 91] 0

k\_1000 219

opm 94

the random choice case path in j120 ./rcpsp/j120.sm/j1202\_9.sm case j1202\_9.sm

27 711.5389702320099 s [104, 242] 10.638297872340425 [0, 0, 0, 0, 10, 12, 22, 12, 22, 32, 32, 19, 10, 11, 27, 22, 32, 27, 18, 19, 34, 19, 28, 41, 31, 31, 11, 33, 47, 11, 34, 28, 34, 34, 41, 28, 5, 48, 35, 61, 44, 49, 43, 28, 48, 33, 23, 33, 10, 34, 51, 44, 49, 59, 62, 11, 12, 57, 29, 41, 44, 38, 44, 66, 53, 52, 54, 56, 34, 61, 21, 21, 52, 49, 31, 10, 64, 62, 54, 21, 19, 69, 48, 70, 24, 77, 54, 58, 71, 48, 77, 58, 10, 58, 64, 66, 56, 71, 24, 75, 69, 58, 52, 73, 80, 89, 75, 63, 84, 76, 71, 79, 86, 89, 80, 89, 97, 97, 98, 99, 94, 104] 0

k\_1000 220

opm 102

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_1.sm case j12030\_1.sm

34 706.4451203346252 s [106, 119] 3.9215686274509802 [0, 0, 0, 0, 10, 10, 15, 12, 20, 10, 26, 24, 14, 9, 4, 20, 20, 27, 26, 25, 23, 9, 33, 14, 22, 28, 4, 15, 14, 26, 24, 32, 18, 36, 30, 45, 20, 32, 30, 15, 33, 35, 17, 20, 26, 20, 22, 33, 36, 29, 14, 38, 33, 42, 40, 12, 23, 35, 38, 43, 48, 42, 28, 33, 35, 52, 56, 25, 47, 63, 62, 52, 62, 52, 58, 66, 48, 26, 52, 45, 53, 36, 36, 48, 63, 56, 56, 63, 33, 49, 60, 61, 58, 63, 52, 45, 64, 58, 69, 63, 59, 45, 73, 71, 71, 67, 74, 73, 64, 73, 77, 71, 79, 82, 82, 83, 89, 98, 65, 101, 80, 106] 0

k\_1000 221

opm 86

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_10.sm case j12030\_10.sm

62 721.952966928482 s [88, 88] 2.3255813953488373 [0, 0, 0, 0, 4, 5, 5, 7, 12, 4, 21, 5, 12, 7, 6, 6, 14, 14, 15, 11, 10, 22, 11, 19, 12, 11, 15, 26, 5, 7, 29, 27, 23, 15, 19, 22, 10, 14, 35, 14, 14, 32, 6, 37, 23, 15, 17, 24, 12, 20, 28, 18, 17, 23, 22, 8, 22, 37, 43, 37, 11, 38, 35, 41, 26, 33, 18, 18, 35, 44, 41, 27, 19, 43, 40, 35, 33, 46, 28, 23, 39, 29, 44, 33, 45, 32, 41, 52, 46, 38, 46, 47, 51, 28, 52, 62, 49, 54, 59, 52, 38, 43, 54, 35, 52, 59, 64, 59, 47, 64, 21, 54, 72, 61, 66, 73, 54, 68, 74, 77, 78, 88] 0

k\_1000 222

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_2.sm case j12030\_2.sm

16 167.68344593048096 s [112, 125] 0.0 [0, 0, 0, 0, 8, 8, 15, 23, 3, 8, 15, 10, 8, 8, 8, 23, 19, 33, 11, 17, 33, 17, 11, 6, 42, 20, 27, 19, 3, 11, 43, 19, 6, 12, 26, 23, 25, 10, 26, 33, 23, 44, 13, 52, 26, 25, 29, 16, 18, 27, 36, 20, 10, 29, 12, 54, 20, 52, 35, 20, 57, 28, 35, 30, 13, 53, 40, 29, 54, 32, 10, 63, 30, 59, 51, 57, 51, 37, 69, 45, 52, 46, 45, 44, 42, 23, 20, 56, 61, 77, 52, 45, 22, 68, 63, 63, 63, 63, 61, 73, 64, 73, 64, 80, 69, 73, 84, 74, 84, 88, 80, 88, 67, 80, 70, 97, 98, 90, 98, 107, 84, 112] 0

k\_1000 223

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_3.sm case j12030\_3.sm

3 49.87520098686218 s [108, 110] 0.0 [0, 0, 0, 0, 6, 6, 3, 12, 6, 12, 19, 4, 9, 9, 4, 18, 28, 22, 4, 7, 7, 9, 25, 33, 10, 33, 3, 33, 36, 38, 19, 28, 20, 38, 25, 38, 32, 12, 33, 44, 36, 33, 29, 38, 43, 44, 25, 49, 19, 9, 43, 3, 43, 52, 47, 44, 51, 36, 38, 3, 26, 26, 52, 33, 38, 12, 51, 44, 44, 61, 46, 7, 16, 12, 41, 12, 32, 54, 60, 64, 53, 63, 53, 29, 72, 63, 64, 61, 80, 54, 60, 89, 62, 54, 69, 68, 69, 64, 69, 65, 80, 70, 65, 71, 77, 77, 52, 77, 72, 80, 85, 74, 90, 97, 79, 83, 82, 88, 102, 97, 90, 108] 0

k\_1000 224

opm 83

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_4.sm case j12030\_4.sm

44 544.1814849376678 s [83, 128] 0.0 [0, 0, 0, 0, 10, 18, 6, 1, 10, 25, 19, 15, 14, 6, 17, 1, 6, 14, 25, 23, 7, 15, 17, 12, 18, 7, 16, 1, 27, 36, 14, 20, 14, 27, 27, 19, 3, 3, 29, 23, 18, 30, 24, 23, 35, 32, 7, 17, 37, 20, 28, 33, 34, 28, 27, 15, 13, 40, 12, 34, 27, 17, 16, 43, 21, 21, 41, 39, 35, 32, 18, 41, 37, 43, 23, 25, 37, 51, 46, 48, 40, 36, 39, 40, 51, 56, 56, 60, 44, 40, 61, 40, 51, 49, 61, 31, 50, 56, 56, 41, 60, 63, 49, 61, 49, 61, 58, 53, 65, 65, 60, 61, 71, 65, 70, 70, 73, 69, 74, 75, 77, 83] 0

k\_1000 225

opm 83

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_5.sm case j12030\_5.sm

45 704.1587557792664 s [91, 133] 9.63855421686747 [0, 0, 0, 24, 12, 2, 5, 5, 6, 13, 5, 22, 13, 10, 10, 30, 6, 13, 20, 30, 20, 17, 20, 22, 44, 24, 34, 34, 2, 39, 27, 13, 38, 23, 13, 24, 29, 10, 24, 38, 10, 37, 30, 16, 36, 37, 46, 46, 42, 17, 14, 20, 12, 50, 17, 23, 30, 14, 17, 38, 29, 24, 39, 37, 20, 70, 29, 39, 33, 51, 31, 58, 42, 48, 38, 50, 56, 40, 27, 23, 40, 68, 54, 47, 60, 47, 37, 37, 42, 30, 39, 65, 60, 76, 54, 60, 55, 57, 64, 63, 65, 73, 74, 77, 64, 78, 55, 70, 79, 74, 75, 79, 64, 85, 81, 85, 79, 79, 87, 89, 81, 91] 0

k\_1000 226

opm 79

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_6.sm case j12030\_6.sm

56 722.1295959949493 s [83, 133] 5.063291139240507 [0, 0, 0, 0, 3, 8, 3, 12, 3, 17, 7, 12, 33, 7, 12, 11, 19, 20, 18, 46, 17, 15, 10, 8, 15, 27, 18, 8, 27, 21, 35, 15, 26, 45, 41, 6, 27, 11, 17, 17, 17, 17, 46, 26, 27, 12, 17, 22, 14, 32, 37, 15, 34, 27, 36, 14, 32, 37, 19, 46, 36, 23, 35, 47, 19, 29, 13, 29, 37, 27, 45, 14, 11, 39, 35, 39, 46, 47, 37, 53, 43, 45, 33, 51, 33, 44, 43, 51, 23, 49, 27, 45, 29, 52, 55, 46, 54, 57, 37, 56, 55, 55, 64, 51, 64, 62, 62, 56, 53, 59, 63, 68, 59, 69, 71, 70, 45, 68, 80, 65, 72, 83] 0

k\_1000 227

opm 93

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_7.sm case j12030\_7.sm

61 716.561678647995 s [96, 145] 3.225806451612903 [0, 0, 0, 0, 4, 8, 9, 14, 8, 17, 13, 17, 8, 19, 13, 22, 23, 13, 23, 27, 23, 8, 24, 10, 24, 34, 17, 33, 34, 19, 8, 34, 45, 10, 40, 16, 38, 27, 23, 43, 25, 37, 14, 28, 62, 44, 38, 39, 17, 47, 34, 23, 16, 43, 28, 24, 25, 47, 50, 4, 28, 27, 69, 46, 50, 33, 47, 35, 20, 25, 35, 39, 30, 65, 57, 36, 65, 62, 39, 46, 54, 49, 53, 58, 49, 62, 62, 29, 53, 50, 71, 43, 51, 58, 75, 60, 68, 53, 62, 66, 76, 72, 72, 79, 14, 70, 78, 51, 65, 75, 79, 70, 70, 73, 83, 85, 77, 74, 82, 90, 86, 96] 0

k\_1000 228

opm 79

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_8.sm case j12030\_8.sm

62 716.608535528183 s [81, 88] 2.5316455696202533 [0, 0, 0, 0, 5, 5, 10, 5, 6, 5, 8, 9, 6, 13, 20, 10, 10, 13, 11, 13, 13, 17, 6, 21, 19, 22, 25, 5, 7, 26, 13, 14, 14, 23, 21, 20, 17, 11, 10, 9, 21, 30, 34, 42, 24, 21, 26, 9, 18, 30, 45, 31, 14, 38, 21, 36, 16, 22, 22, 28, 31, 31, 23, 55, 30, 46, 23, 42, 29, 42, 18, 24, 42, 31, 48, 58, 30, 40, 34, 32, 48, 30, 39, 16, 45, 24, 42, 58, 52, 24, 37, 58, 14, 20, 45, 45, 54, 47, 31, 64, 41, 37, 47, 52, 31, 47, 51, 50, 51, 56, 52, 65, 47, 61, 62, 52, 70, 78, 75, 79, 47, 81] 0

k\_1000 229

opm 93

the random choice case path in j120 ./rcpsp/j120.sm/j12030\_9.sm case j12030\_9.sm

38 581.80513215065 s [93, 105] 0.0 [0, 0, 0, 0, 2, 2, 2, 2, 7, 12, 11, 5, 19, 2, 13, 11, 7, 16, 9, 2, 16, 21, 16, 15, 10, 21, 26, 19, 22, 19, 26, 19, 12, 12, 10, 23, 11, 20, 40, 27, 29, 12, 29, 16, 26, 16, 28, 26, 22, 32, 28, 21, 35, 15, 19, 31, 39, 22, 22, 15, 31, 54, 57, 37, 45, 12, 19, 30, 28, 25, 50, 50, 41, 29, 37, 50, 47, 37, 37, 41, 36, 52, 42, 52, 62, 50, 45, 44, 35, 60, 53, 46, 48, 45, 55, 52, 55, 59, 72, 64, 55, 67, 47, 67, 70, 72, 72, 40, 74, 73, 77, 77, 77, 76, 52, 78, 76, 88, 82, 89, 86, 93] 0

k\_1000 230

opm 197

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_1.sm case j12031\_1.sm

11 1098.089682817459 s [224, 253] 13.705583756345177 [0, 0, 0, 0, 8, 8, 8, 10, 22, 11, 29, 11, 11, 49, 59, 17, 29, 38, 1, 38, 21, 93, 42, 86, 59, 22, 43, 30, 49, 66, 78, 98, 3, 38, 17, 72, 59, 84, 47, 78, 102, 86, 109, 58, 72, 108, 102, 124, 69, 116, 43, 56, 3, 124, 152, 66, 92, 86, 131, 115, 136, 76, 159, 115, 159, 56, 11, 69, 171, 75, 135, 98, 91, 133, 141, 109, 151, 148, 98, 120, 138, 95, 163, 133, 168, 86, 180, 177, 155, 28, 143, 136, 143, 151, 113, 186, 143, 156, 190, 164, 197, 174, 124, 168, 159, 169, 180, 191, 180, 200, 187, 192, 200, 200, 204, 210, 210, 210, 215, 139, 216, 224] 0

k\_1000 231

opm 225

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_10.sm case j12031\_10.sm

11 2040.1998007297516 s [256, 262] 13.777777777777779 [0, 1, 0, 0, 7, 13, 23, 23, 7, 13, 1, 36, 28, 28, 48, 46, 55, 23, 57, 46, 68, 18, 91, 49, 61, 46, 78, 68, 91, 117, 100, 97, 131, 86, 127, 32, 147, 131, 18, 66, 19, 7, 117, 152, 147, 123, 100, 97, 20, 155, 90, 162, 106, 109, 31, 155, 180, 111, 78, 58, 130, 113, 86, 134, 36, 120, 68, 46, 138, 132, 38, 147, 125, 132, 95, 49, 127, 77, 162, 141, 106, 125, 172, 55, 180, 104, 147, 206, 167, 226, 174, 179, 204, 228, 207, 181, 242, 174, 114, 147, 207, 155, 184, 172, 215, 194, 207, 190, 232, 194, 197, 235, 197, 221, 235, 214, 228, 218, 242, 250, 215, 256] 0

k\_1000 232

opm 192

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_2.sm case j12031\_2.sm

11 1508.3292818069458 s [218, 279] 13.541666666666666 [0, 3, 0, 0, 9, 9, 11, 19, 11, 17, 16, 49, 25, 79, 30, 9, 31, 133, 71, 31, 31, 17, 16, 64, 32, 34, 24, 96, 38, 33, 111, 23, 109, 35, 19, 57, 118, 33, 81, 99, 102, 80, 120, 91, 44, 47, 3, 71, 64, 121, 121, 45, 173, 57, 89, 92, 154, 70, 95, 88, 56, 109, 101, 80, 45, 137, 122, 101, 96, 119, 99, 84, 92, 133, 133, 182, 143, 141, 185, 119, 116, 64, 122, 160, 126, 144, 154, 126, 164, 135, 151, 128, 149, 173, 186, 143, 96, 135, 181, 185, 155, 165, 191, 141, 189, 155, 160, 199, 174, 190, 200, 140, 164, 204, 133, 203, 205, 213, 217, 206, 203, 218] 0

k\_1000 233

opm 173

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_3.sm case j12031\_3.sm

11 1092.6691567897797 s [199, 1055] 15.028901734104046 [0, 0, 0, 7, 3, 6, 23, 14, 6, 21, 33, 44, 39, 7, 48, 10, 52, 54, 17, 42, 69, 21, 33, 48, 33, 58, 16, 3, 53, 39, 56, 31, 51, 48, 69, 35, 56, 5, 78, 74, 86, 95, 60, 39, 9, 77, 84, 58, 56, 93, 64, 92, 98, 115, 62, 56, 100, 100, 98, 60, 67, 26, 109, 113, 106, 104, 115, 86, 104, 118, 118, 104, 19, 118, 123, 120, 101, 105, 128, 134, 74, 148, 125, 139, 154, 152, 138, 138, 157, 134, 167, 144, 148, 127, 135, 162, 64, 76, 165, 171, 146, 131, 157, 165, 162, 156, 163, 173, 130, 171, 179, 170, 177, 186, 186, 188, 176, 144, 191, 180, 190, 199] 0

k\_1000 234

opm 218

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_4.sm case j12031\_4.sm

11 1865.0191679000854 s [258, 395] 18.34862385321101 [0, 15, 0, 0, 7, 7, 16, 31, 15, 40, 47, 9, 19, 29, 57, 47, 31, 24, 52, 52, 51, 77, 61, 90, 47, 62, 61, 68, 56, 123, 73, 90, 11, 28, 31, 74, 68, 75, 27, 83, 92, 91, 125, 113, 95, 111, 101, 34, 107, 93, 107, 203, 133, 166, 106, 100, 27, 133, 147, 152, 165, 120, 156, 93, 41, 137, 75, 71, 129, 135, 134, 196, 185, 62, 176, 156, 213, 147, 82, 143, 176, 83, 113, 199, 156, 213, 243, 125, 185, 10, 191, 145, 175, 196, 180, 137, 191, 193, 199, 111, 209, 203, 206, 217, 165, 175, 182, 217, 228, 222, 222, 231, 231, 237, 199, 204, 233, 216, 250, 251, 243, 258] 0

k\_1000 235

opm 200

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_5.sm case j12031\_5.sm

11 2474.823549747467 s [238, 408] 19.0 [0, 0, 0, 1, 14, 11, 26, 10, 38, 1, 5, 5, 14, 14, 18, 47, 28, 41, 47, 28, 43, 13, 28, 23, 59, 62, 52, 29, 47, 78, 84, 22, 52, 69, 96, 29, 122, 68, 14, 72, 32, 102, 133, 91, 78, 23, 29, 53, 112, 87, 43, 103, 112, 62, 87, 14, 59, 122, 133, 72, 129, 87, 138, 57, 117, 118, 128, 128, 91, 118, 142, 145, 28, 147, 156, 18, 158, 161, 33, 158, 142, 168, 102, 156, 172, 158, 147, 165, 176, 182, 167, 183, 142, 183, 152, 189, 178, 156, 188, 219, 192, 199, 193, 181, 208, 208, 156, 188, 193, 209, 199, 161, 213, 219, 198, 216, 182, 219, 207, 228, 229, 238] 0

k\_1000 236

opm 191

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_6.sm case j12031\_6.sm

11 1605.6046676635742 s [205, 415] 7.329842931937172 [0, 3, 0, 0, 3, 3, 6, 13, 6, 42, 6, 20, 18, 31, 25, 32, 69, 13, 49, 34, 59, 25, 49, 26, 42, 15, 32, 26, 65, 21, 34, 69, 109, 84, 13, 113, 22, 27, 69, 87, 97, 101, 116, 92, 93, 40, 32, 87, 101, 83, 43, 87, 118, 74, 123, 29, 78, 48, 55, 109, 69, 131, 84, 46, 88, 23, 110, 76, 131, 69, 136, 147, 118, 93, 140, 163, 165, 43, 147, 74, 101, 146, 124, 116, 131, 121, 162, 155, 96, 153, 131, 167, 123, 165, 157, 144, 136, 170, 174, 99, 175, 163, 168, 162, 157, 165, 175, 174, 20, 165, 170, 92, 140, 146, 179, 182, 186, 189, 180, 176, 197, 205] 0

k\_1000 237

opm 205

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_7.sm case j12031\_7.sm

11 2130.740936279297 s [231, 565] 12.682926829268293 [0, 0, 0, 0, 8, 46, 8, 10, 7, 10, 7, 19, 23, 17, 17, 26, 10, 31, 14, 56, 45, 31, 27, 52, 31, 53, 62, 66, 73, 40, 65, 48, 36, 62, 50, 56, 23, 65, 82, 73, 103, 92, 96, 104, 74, 105, 39, 96, 111, 111, 117, 72, 96, 118, 104, 121, 80, 112, 92, 104, 29, 131, 111, 17, 86, 136, 144, 145, 150, 56, 136, 136, 125, 118, 138, 143, 155, 145, 160, 164, 169, 160, 92, 181, 163, 171, 173, 181, 173, 125, 169, 189, 191, 82, 181, 210, 190, 200, 200, 177, 211, 54, 173, 181, 155, 191, 190, 209, 212, 210, 210, 218, 218, 219, 131, 220, 155, 216, 225, 226, 224, 231] 0

k\_1000 238

opm 192

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_8.sm case j12031\_8.sm

11 1645.7906651496887 s [224, 664] 16.666666666666664 [0, 0, 0, 0, 10, 10, 10, 28, 18, 6, 33, 14, 46, 6, 36, 36, 20, 17, 131, 50, 33, 40, 22, 30, 17, 63, 24, 18, 30, 28, 139, 38, 92, 164, 110, 77, 77, 73, 53, 112, 75, 62, 55, 36, 40, 116, 83, 139, 118, 55, 44, 91, 122, 100, 110, 63, 131, 49, 83, 55, 157, 139, 102, 87, 149, 149, 71, 113, 146, 122, 55, 161, 80, 71, 154, 90, 118, 128, 171, 72, 18, 154, 131, 91, 169, 157, 133, 90, 72, 115, 199, 153, 171, 174, 161, 166, 164, 172, 100, 181, 99, 156, 122, 188, 209, 181, 179, 198, 185, 183, 211, 189, 191, 206, 206, 174, 188, 215, 212, 191, 219, 224] 0

k\_1000 239

opm 189

the random choice case path in j120 ./rcpsp/j120.sm/j12031\_9.sm case j12031\_9.sm

11 1574.7717061042786 s [223, 273] 17.989417989417987 [0, 0, 1, 0, 24, 8, 10, 52, 22, 28, 28, 8, 28, 55, 31, 1, 28, 30, 33, 12, 51, 33, 22, 37, 23, 23, 45, 61, 40, 44, 8, 70, 50, 12, 42, 55, 71, 15, 75, 1, 70, 37, 33, 85, 94, 109, 52, 65, 23, 100, 75, 80, 83, 85, 105, 75, 86, 108, 115, 124, 125, 45, 98, 65, 104, 91, 131, 117, 134, 44, 134, 38, 124, 86, 38, 149, 144, 150, 156, 159, 133, 140, 186, 117, 171, 194, 52, 134, 159, 156, 141, 140, 144, 161, 176, 98, 171, 182, 186, 176, 140, 166, 115, 147, 195, 189, 171, 202, 195, 175, 33, 176, 190, 157, 211, 189, 197, 218, 221, 171, 204, 223] 0

k\_1000 240

opm 147

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_1.sm case j12032\_1.sm

15 734.8308584690094 s [152, 166] 3.4013605442176873 [0, 0, 0, 0, 7, 16, 9, 7, 25, 25, 25, 30, 43, 36, 13, 39, 19, 2, 39, 15, 43, 37, 81, 18, 53, 9, 90, 2, 18, 36, 25, 44, 40, 30, 45, 56, 17, 64, 18, 47, 42, 16, 68, 54, 30, 80, 60, 24, 43, 90, 62, 50, 69, 54, 29, 94, 97, 81, 98, 94, 68, 91, 90, 58, 29, 16, 72, 73, 9, 50, 60, 81, 68, 45, 38, 74, 98, 12, 102, 47, 113, 45, 19, 61, 101, 105, 97, 88, 84, 107, 110, 104, 108, 116, 113, 107, 113, 116, 114, 98, 80, 121, 121, 111, 104, 116, 120, 130, 126, 126, 128, 134, 110, 140, 120, 136, 126, 142, 149, 145, 145, 152] 0

k\_1000 241

opm 131

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_10.sm case j12032\_10.sm

13 731.9741258621216 s [156, 329] 19.083969465648856 [0, 0, 0, 0, 1, 22, 6, 4, 36, 2, 9, 3, 45, 12, 2, 31, 4, 10, 4, 45, 16, 10, 39, 20, 45, 30, 35, 30, 11, 6, 58, 47, 18, 58, 43, 12, 10, 50, 52, 23, 16, 60, 61, 60, 35, 68, 24, 65, 12, 20, 70, 10, 34, 82, 11, 50, 54, 41, 76, 65, 60, 68, 6, 65, 74, 75, 83, 23, 35, 83, 52, 65, 64, 42, 82, 79, 91, 68, 95, 90, 103, 97, 93, 83, 75, 95, 104, 104, 93, 112, 113, 103, 119, 103, 113, 124, 99, 118, 105, 119, 124, 120, 99, 120, 105, 124, 126, 135, 124, 128, 136, 126, 128, 143, 136, 136, 140, 147, 127, 155, 139, 156] 0

k\_1000 242

opm 131

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_2.sm case j12032\_2.sm

16 759.6991083621979 s [159, 911] 21.374045801526716 [0, 0, 0, 0, 5, 8, 5, 28, 15, 9, 43, 34, 22, 47, 14, 42, 16, 43, 56, 25, 29, 29, 58, 30, 5, 30, 47, 16, 20, 55, 56, 37, 22, 48, 40, 67, 22, 34, 77, 50, 43, 72, 39, 63, 15, 65, 86, 82, 70, 6, 70, 63, 91, 20, 50, 38, 67, 73, 58, 77, 46, 58, 20, 93, 43, 75, 86, 95, 91, 106, 101, 106, 82, 116, 99, 73, 97, 82, 99, 40, 84, 75, 106, 116, 94, 108, 118, 125, 131, 108, 108, 88, 118, 126, 122, 115, 123, 133, 126, 130, 130, 134, 91, 133, 142, 137, 38, 148, 142, 108, 133, 134, 152, 116, 130, 152, 139, 154, 158, 149, 142, 159] 0

k\_1000 243

opm 145

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_3.sm case j12032\_3.sm

21 739.1459369659424 s [169, 1242] 16.551724137931036 [0, 0, 0, 0, 2, 9, 11, 9, 22, 25, 9, 46, 27, 25, 13, 12, 37, 17, 52, 56, 33, 52, 17, 61, 67, 63, 63, 33, 87, 30, 61, 6, 74, 17, 81, 94, 34, 75, 83, 2, 76, 82, 19, 67, 39, 45, 92, 12, 63, 76, 59, 60, 19, 67, 39, 92, 94, 73, 60, 101, 87, 76, 95, 104, 109, 72, 23, 17, 46, 102, 110, 53, 86, 109, 100, 22, 112, 34, 104, 109, 119, 78, 116, 113, 111, 23, 10, 100, 119, 122, 125, 119, 13, 127, 125, 82, 116, 127, 134, 111, 137, 125, 132, 134, 140, 119, 147, 140, 148, 147, 137, 149, 138, 152, 149, 157, 146, 153, 163, 157, 158, 169] 0

k\_1000 244

opm 135

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_4.sm case j12032\_4.sm

13 668.6677389144897 s [153, 160] 13.333333333333334 [0, 0, 0, 0, 10, 8, 9, 8, 3, 13, 12, 10, 36, 51, 41, 14, 24, 3, 45, 54, 23, 51, 64, 47, 24, 45, 8, 4, 19, 24, 48, 54, 58, 29, 61, 46, 12, 21, 39, 39, 33, 12, 54, 59, 64, 52, 25, 54, 33, 56, 68, 77, 80, 61, 71, 80, 59, 69, 86, 99, 85, 59, 29, 77, 37, 62, 108, 39, 93, 100, 82, 82, 9, 73, 64, 87, 103, 68, 92, 98, 66, 113, 62, 37, 107, 42, 94, 95, 87, 122, 84, 97, 94, 113, 92, 92, 108, 65, 100, 30, 103, 107, 98, 133, 125, 114, 128, 113, 123, 130, 123, 73, 135, 137, 116, 138, 139, 133, 143, 143, 143, 153] 0

k\_1000 245

opm 138

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_5.sm case j12032\_5.sm

17 732.2846851348877 s [162, 220] 17.391304347826086 [0, 0, 0, 0, 9, 13, 25, 34, 5, 13, 9, 11, 10, 19, 33, 49, 60, 29, 80, 5, 20, 75, 13, 21, 47, 34, 37, 87, 22, 25, 20, 29, 62, 34, 43, 51, 70, 28, 52, 54, 92, 37, 35, 43, 69, 55, 49, 46, 30, 54, 76, 60, 63, 55, 63, 75, 60, 62, 41, 84, 67, 67, 41, 10, 77, 88, 77, 79, 80, 90, 55, 72, 61, 55, 100, 92, 108, 103, 103, 100, 108, 116, 90, 58, 108, 126, 108, 95, 87, 97, 93, 100, 110, 106, 97, 103, 72, 98, 107, 114, 95, 117, 124, 111, 135, 109, 126, 140, 112, 120, 135, 150, 124, 140, 136, 141, 144, 145, 158, 154, 140, 162] 0

k\_1000 246

opm 128

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_6.sm case j12032\_6.sm

21 744.6685767173767 s [143, 156] 11.71875 [0, 0, 0, 0, 4, 2, 6, 6, 15, 17, 11, 17, 25, 25, 27, 22, 8, 11, 26, 48, 26, 27, 31, 34, 42, 82, 15, 9, 77, 2, 32, 58, 20, 27, 29, 13, 107, 29, 39, 40, 48, 13, 45, 34, 115, 40, 34, 2, 74, 53, 92, 66, 6, 35, 62, 57, 37, 49, 37, 65, 100, 98, 55, 58, 60, 66, 108, 18, 35, 18, 17, 79, 76, 72, 81, 55, 92, 42, 73, 66, 74, 72, 76, 37, 76, 107, 74, 91, 66, 37, 77, 63, 55, 112, 77, 94, 80, 93, 86, 93, 104, 108, 83, 103, 125, 112, 110, 100, 111, 120, 108, 124, 125, 116, 121, 118, 133, 131, 124, 128, 138, 143] 0

k\_1000 247

opm 122

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_7.sm case j12032\_7.sm

19 729.0865044593811 s [139, 139] 13.934426229508196 [0, 0, 0, 0, 6, 6, 4, 7, 16, 12, 4, 7, 15, 12, 12, 9, 28, 39, 26, 30, 12, 15, 20, 36, 22, 40, 42, 31, 45, 40, 51, 41, 55, 62, 62, 50, 4, 15, 48, 54, 60, 62, 63, 34, 69, 65, 20, 54, 48, 65, 26, 15, 40, 23, 17, 10, 32, 29, 39, 18, 19, 45, 18, 20, 70, 59, 71, 69, 75, 32, 72, 80, 20, 50, 78, 71, 78, 70, 63, 53, 77, 78, 35, 72, 105, 79, 71, 48, 85, 83, 79, 85, 87, 106, 89, 79, 88, 87, 88, 97, 88, 94, 115, 99, 96, 108, 99, 106, 116, 115, 88, 123, 97, 116, 123, 125, 101, 129, 135, 130, 130, 139] 0

k\_1000 248

opm 135

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_8.sm case j12032\_8.sm

13 687.7501337528229 s [151, 194] 11.851851851851853 [0, 0, 0, 0, 4, 11, 2, 2, 16, 6, 29, 18, 18, 18, 20, 20, 28, 27, 26, 32, 40, 32, 40, 4, 28, 47, 27, 54, 57, 33, 43, 8, 52, 8, 43, 28, 60, 37, 68, 43, 28, 52, 27, 48, 6, 62, 71, 52, 67, 22, 40, 72, 75, 58, 58, 63, 82, 70, 88, 58, 75, 62, 70, 77, 87, 83, 57, 84, 79, 77, 32, 49, 79, 93, 97, 98, 93, 93, 99, 99, 102, 105, 89, 99, 74, 100, 101, 103, 118, 111, 102, 108, 106, 108, 123, 4, 120, 98, 109, 114, 129, 109, 120, 128, 114, 124, 132, 110, 116, 129, 130, 123, 132, 123, 136, 134, 137, 140, 145, 141, 131, 151] 0

k\_1000 249

opm 127

the random choice case path in j120 ./rcpsp/j120.sm/j12032\_9.sm case j12032\_9.sm

20 712.1285619735718 s [144, 149] 13.385826771653544 [0, 0, 0, 0, 6, 11, 31, 6, 41, 11, 50, 47, 11, 49, 47, 10, 46, 5, 53, 13, 36, 23, 49, 53, 15, 54, 25, 24, 26, 72, 20, 49, 15, 14, 68, 54, 50, 51, 32, 23, 20, 26, 26, 8, 15, 64, 26, 33, 62, 62, 33, 76, 66, 5, 88, 60, 62, 31, 90, 33, 76, 72, 30, 24, 82, 43, 92, 41, 88, 62, 51, 36, 101, 102, 75, 83, 78, 109, 78, 83, 83, 39, 64, 36, 92, 43, 106, 109, 116, 110, 102, 84, 119, 89, 84, 72, 84, 111, 126, 87, 135, 95, 94, 114, 110, 119, 113, 118, 89, 136, 117, 120, 129, 130, 113, 121, 130, 136, 138, 139, 138, 144] 0

k\_1000 250

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_1.sm case j12033\_1.sm

23 725.5636119842529 s [129, 180] 20.5607476635514 [0, 0, 0, 0, 9, 6, 11, 7, 6, 9, 26, 22, 17, 18, 11, 16, 18, 27, 25, 40, 11, 12, 17, 37, 16, 17, 39, 7, 25, 36, 34, 30, 15, 30, 35, 26, 39, 25, 17, 34, 32, 43, 17, 45, 30, 24, 46, 35, 36, 46, 46, 50, 32, 55, 51, 26, 46, 18, 51, 40, 52, 65, 58, 65, 77, 71, 49, 31, 68, 74, 75, 58, 80, 73, 42, 87, 53, 82, 93, 58, 75, 88, 75, 80, 68, 77, 40, 68, 88, 43, 77, 80, 85, 84, 85, 87, 93, 88, 94, 58, 78, 87, 71, 93, 94, 94, 99, 103, 103, 99, 85, 97, 105, 105, 108, 114, 103, 102, 111, 105, 121, 129] 0

k\_1000 251

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_10.sm case j12033\_10.sm

18 717.5034959316254 s [126, 147] 18.867924528301888 [0, 0, 0, 0, 2, 6, 27, 6, 7, 27, 13, 21, 15, 3, 13, 23, 32, 32, 15, 39, 17, 30, 32, 20, 23, 42, 22, 20, 46, 27, 65, 43, 33, 3, 25, 8, 21, 58, 24, 75, 30, 46, 41, 7, 77, 52, 68, 2, 35, 22, 54, 53, 69, 49, 63, 43, 49, 60, 67, 53, 75, 36, 58, 24, 84, 11, 33, 86, 24, 53, 67, 69, 55, 77, 66, 58, 82, 88, 25, 66, 69, 79, 85, 55, 55, 82, 77, 42, 87, 89, 89, 92, 82, 102, 94, 102, 95, 85, 103, 38, 97, 99, 98, 106, 84, 106, 68, 92, 108, 101, 95, 109, 103, 93, 111, 116, 120, 116, 124, 108, 124, 126] 0

k\_1000 252

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_2.sm case j12033\_2.sm

17 707.7097496986389 s [125, 171] 11.607142857142858 [0, 0, 0, 0, 3, 1, 9, 17, 9, 21, 3, 5, 18, 13, 26, 32, 25, 25, 8, 32, 19, 11, 19, 6, 19, 17, 30, 28, 32, 11, 26, 37, 21, 30, 42, 29, 42, 46, 25, 56, 50, 45, 40, 52, 37, 46, 56, 38, 64, 61, 45, 5, 56, 11, 55, 61, 46, 53, 61, 58, 3, 45, 71, 52, 7, 77, 61, 70, 65, 65, 71, 61, 74, 82, 70, 65, 66, 37, 77, 87, 34, 34, 82, 66, 74, 97, 89, 73, 91, 85, 76, 77, 77, 90, 101, 84, 97, 93, 97, 45, 92, 105, 101, 87, 100, 109, 100, 89, 99, 98, 104, 109, 105, 110, 97, 119, 112, 106, 117, 117, 123, 125] 0

k\_1000 253

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_3.sm case j12033\_3.sm

31 731.7347795963287 s [118, 136] 10.2803738317757 [0, 0, 0, 0, 5, 10, 14, 8, 5, 10, 8, 15, 12, 11, 21, 13, 24, 18, 20, 11, 24, 32, 30, 34, 35, 20, 13, 6, 12, 20, 29, 14, 30, 20, 34, 29, 50, 21, 5, 26, 40, 43, 38, 40, 46, 55, 52, 44, 57, 38, 51, 20, 60, 36, 27, 28, 59, 54, 64, 66, 61, 64, 39, 44, 54, 37, 71, 76, 79, 32, 76, 39, 21, 60, 76, 22, 54, 79, 81, 64, 61, 73, 44, 89, 84, 51, 98, 73, 80, 80, 87, 64, 57, 71, 83, 95, 85, 96, 94, 52, 79, 84, 55, 104, 60, 95, 85, 104, 98, 95, 95, 110, 87, 102, 99, 110, 88, 109, 116, 111, 116, 118] 0

k\_1000 254

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_4.sm case j12033\_4.sm

27 692.7556490898132 s [129, 425] 15.178571428571427 [0, 6, 0, 0, 15, 6, 4, 11, 15, 2, 6, 23, 12, 1, 19, 6, 22, 2, 4, 27, 1, 21, 22, 24, 15, 16, 21, 24, 31, 34, 43, 33, 33, 23, 32, 27, 45, 35, 41, 43, 26, 19, 29, 24, 23, 61, 52, 12, 6, 26, 53, 52, 57, 43, 66, 72, 63, 42, 49, 43, 43, 65, 53, 27, 57, 66, 72, 58, 69, 60, 69, 13, 65, 69, 76, 34, 84, 81, 72, 79, 65, 86, 69, 44, 42, 77, 84, 35, 91, 71, 76, 91, 93, 98, 72, 81, 99, 99, 99, 101, 49, 88, 109, 100, 107, 94, 102, 104, 88, 107, 111, 116, 111, 110, 116, 118, 117, 77, 123, 120, 123, 129] 0

k\_1000 255

opm 142

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_5.sm case j12033\_5.sm

13 754.2523715496063 s [162, 172] 14.084507042253522 [0, 0, 0, 0, 3, 8, 22, 20, 14, 8, 6, 23, 82, 17, 32, 22, 4, 37, 99, 25, 16, 37, 41, 112, 17, 64, 74, 86, 52, 44, 93, 33, 25, 32, 9, 50, 77, 30, 6, 74, 117, 57, 50, 86, 53, 37, 56, 87, 58, 29, 62, 16, 41, 37, 61, 66, 68, 109, 126, 83, 40, 50, 41, 91, 96, 18, 88, 72, 111, 112, 100, 53, 25, 101, 44, 22, 79, 119, 96, 102, 124, 119, 121, 110, 129, 95, 91, 111, 128, 100, 57, 119, 128, 133, 102, 128, 119, 110, 138, 110, 146, 26, 151, 122, 124, 136, 44, 137, 134, 147, 41, 146, 140, 149, 150, 140, 147, 151, 153, 155, 153, 162] 0

k\_1000 256

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_6.sm case j12033\_6.sm

26 696.4854567050934 s [130, 130] 13.043478260869565 [0, 0, 0, 0, 9, 9, 8, 9, 13, 13, 13, 26, 17, 17, 17, 8, 17, 26, 13, 5, 33, 18, 34, 39, 19, 17, 18, 31, 24, 51, 21, 49, 44, 25, 8, 61, 26, 39, 18, 24, 45, 17, 38, 28, 57, 26, 34, 58, 30, 13, 50, 28, 58, 67, 49, 30, 69, 46, 58, 15, 50, 28, 26, 48, 35, 50, 75, 64, 61, 67, 60, 46, 69, 79, 78, 60, 92, 58, 69, 80, 77, 55, 86, 35, 45, 95, 66, 69, 64, 66, 35, 86, 93, 81, 89, 99, 76, 89, 101, 93, 104, 95, 96, 104, 95, 102, 109, 96, 101, 110, 111, 72, 116, 111, 109, 122, 107, 123, 125, 112, 120, 130] 0

k\_1000 257

opm 123

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_7.sm case j12033\_7.sm

20 728.2955961227417 s [143, 309] 16.260162601626014 [0, 0, 0, 0, 8, 3, 8, 16, 23, 3, 31, 11, 23, 23, 40, 50, 8, 30, 32, 16, 28, 50, 5, 12, 35, 40, 62, 21, 30, 14, 35, 20, 21, 38, 5, 50, 45, 39, 23, 45, 58, 53, 31, 35, 53, 38, 60, 60, 40, 45, 55, 72, 32, 66, 32, 30, 16, 68, 35, 52, 12, 58, 22, 65, 82, 39, 76, 73, 45, 72, 12, 69, 73, 94, 66, 64, 45, 82, 83, 52, 32, 86, 45, 60, 88, 42, 50, 55, 65, 63, 93, 76, 83, 83, 79, 89, 86, 83, 61, 96, 96, 103, 110, 112, 109, 94, 96, 52, 117, 116, 121, 102, 104, 123, 117, 121, 125, 124, 127, 104, 133, 143] 0

k\_1000 258

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_8.sm case j12033\_8.sm

20 763.6591715812683 s [131, 140] 18.01801801801802 [0, 0, 0, 0, 1, 1, 6, 6, 1, 8, 7, 17, 12, 12, 11, 20, 14, 29, 25, 17, 20, 17, 27, 20, 18, 12, 36, 28, 38, 31, 40, 7, 32, 32, 8, 39, 40, 59, 40, 6, 41, 39, 15, 34, 34, 36, 56, 47, 47, 53, 85, 97, 34, 27, 48, 49, 58, 53, 48, 53, 109, 25, 65, 40, 44, 64, 66, 71, 81, 18, 64, 102, 47, 81, 71, 63, 71, 41, 107, 49, 59, 74, 64, 76, 69, 81, 11, 71, 84, 71, 72, 84, 97, 64, 108, 76, 40, 89, 96, 94, 81, 77, 88, 116, 88, 92, 84, 106, 106, 92, 108, 112, 88, 118, 104, 104, 114, 114, 124, 112, 125, 131] 0

k\_1000 259

opm 114

the random choice case path in j120 ./rcpsp/j120.sm/j12033\_9.sm case j12033\_9.sm

21 750.672824382782 s [134, 140] 17.543859649122805 [0, 0, 0, 0, 7, 11, 7, 16, 11, 11, 12, 2, 21, 12, 21, 28, 36, 21, 16, 22, 17, 36, 30, 27, 45, 14, 14, 18, 28, 39, 27, 43, 17, 7, 31, 32, 84, 24, 60, 31, 24, 50, 51, 41, 39, 72, 65, 33, 63, 45, 72, 28, 28, 77, 41, 57, 54, 50, 35, 53, 77, 15, 22, 62, 31, 63, 82, 82, 55, 82, 51, 73, 45, 4, 72, 87, 87, 64, 51, 75, 39, 64, 51, 55, 30, 102, 95, 65, 75, 81, 90, 83, 84, 86, 99, 57, 68, 86, 72, 107, 112, 81, 94, 116, 89, 53, 89, 99, 109, 93, 109, 106, 109, 102, 109, 99, 114, 119, 127, 118, 123, 134] 0

k\_1000 260

opm 78

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_1.sm case j12034\_1.sm

36 727.9063053131104 s [90, 106] 15.384615384615385 [0, 0, 0, 0, 5, 8, 8, 7, 8, 12, 5, 5, 7, 6, 8, 14, 29, 14, 8, 12, 12, 6, 34, 6, 6, 19, 7, 25, 27, 44, 18, 24, 28, 14, 14, 43, 21, 14, 19, 22, 23, 38, 21, 15, 22, 24, 37, 9, 34, 28, 40, 25, 7, 40, 9, 45, 42, 37, 43, 15, 19, 28, 27, 39, 52, 24, 34, 51, 44, 37, 21, 52, 25, 30, 18, 31, 48, 55, 58, 52, 61, 35, 31, 36, 42, 61, 52, 63, 44, 73, 58, 35, 38, 73, 45, 53, 51, 69, 45, 47, 49, 46, 56, 55, 55, 74, 60, 55, 61, 64, 80, 76, 66, 74, 61, 79, 67, 66, 81, 83, 81, 90] 0

k\_1000 261

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_10.sm case j12034\_10.sm

31 703.5298612117767 s [111, 590] 9.900990099009901 [0, 0, 0, 0, 10, 8, 16, 16, 19, 11, 22, 10, 8, 11, 11, 20, 16, 20, 30, 26, 24, 24, 24, 10, 10, 34, 33, 8, 26, 28, 26, 30, 26, 24, 11, 24, 13, 32, 49, 39, 23, 34, 56, 43, 44, 65, 21, 42, 40, 26, 56, 46, 54, 21, 25, 34, 42, 55, 54, 50, 53, 32, 33, 42, 34, 44, 72, 72, 60, 43, 50, 60, 52, 40, 50, 72, 48, 59, 50, 63, 39, 57, 42, 66, 46, 40, 46, 62, 70, 63, 72, 73, 76, 69, 77, 78, 86, 50, 78, 71, 76, 77, 80, 77, 82, 85, 85, 81, 85, 90, 88, 87, 77, 88, 87, 98, 83, 97, 107, 105, 97, 111] 0

k\_1000 262

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_2.sm case j12034\_2.sm

26 705.1416053771973 s [122, 190] 16.19047619047619 [0, 0, 0, 0, 9, 5, 12, 9, 12, 30, 13, 19, 5, 16, 29, 18, 31, 11, 17, 30, 7, 28, 28, 33, 28, 23, 22, 28, 15, 20, 5, 44, 23, 59, 32, 33, 35, 42, 64, 13, 45, 20, 51, 38, 46, 28, 63, 37, 19, 31, 65, 23, 78, 38, 20, 41, 34, 49, 71, 28, 66, 29, 68, 17, 27, 75, 48, 30, 54, 59, 10, 46, 53, 58, 87, 58, 64, 56, 71, 71, 72, 22, 48, 45, 73, 73, 74, 63, 44, 90, 66, 82, 58, 92, 59, 75, 83, 75, 71, 85, 78, 83, 75, 92, 52, 99, 64, 101, 92, 74, 93, 93, 110, 99, 99, 99, 105, 92, 90, 114, 113, 122] 0

k\_1000 263

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_3.sm case j12034\_3.sm

36 703.90997838974 s [108, 164] 6.9306930693069315 [0, 0, 0, 0, 9, 9, 9, 9, 7, 9, 12, 26, 15, 29, 12, 12, 15, 18, 7, 15, 21, 15, 19, 9, 21, 21, 27, 35, 17, 26, 42, 20, 42, 7, 18, 10, 29, 56, 30, 26, 9, 49, 29, 60, 52, 39, 35, 40, 35, 42, 43, 52, 41, 30, 21, 30, 46, 31, 46, 33, 55, 45, 37, 37, 40, 26, 53, 33, 53, 40, 70, 58, 64, 38, 72, 72, 73, 64, 46, 17, 47, 55, 56, 62, 79, 70, 79, 87, 56, 64, 58, 75, 68, 67, 66, 74, 87, 62, 73, 72, 66, 73, 73, 72, 71, 81, 78, 87, 83, 87, 82, 86, 84, 90, 92, 97, 97, 92, 102, 102, 95, 108] 0

k\_1000 264

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_4.sm case j12034\_4.sm

41 729.634893655777 s [110, 168] 15.789473684210526 [0, 0, 0, 0, 10, 4, 4, 11, 11, 10, 11, 14, 14, 14, 4, 18, 10, 16, 13, 12, 18, 20, 17, 13, 24, 25, 26, 23, 20, 41, 46, 37, 24, 17, 46, 16, 27, 33, 24, 25, 10, 17, 47, 33, 25, 33, 33, 33, 20, 39, 33, 34, 34, 56, 54, 22, 26, 56, 65, 55, 29, 58, 29, 34, 40, 36, 27, 40, 64, 36, 45, 42, 47, 23, 37, 50, 52, 42, 22, 39, 45, 54, 60, 38, 50, 67, 56, 77, 67, 52, 53, 60, 64, 60, 64, 65, 50, 74, 60, 61, 52, 72, 76, 52, 54, 74, 84, 83, 54, 74, 76, 67, 89, 80, 99, 74, 79, 70, 83, 107, 80, 110] 0

k\_1000 265

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_5.sm case j12034\_5.sm

32 730.8245017528534 s [111, 165] 7.766990291262135 [0, 0, 0, 0, 24, 9, 12, 7, 9, 12, 22, 28, 17, 12, 37, 7, 7, 12, 2, 12, 17, 62, 44, 12, 2, 24, 18, 15, 20, 33, 11, 35, 18, 25, 19, 37, 36, 37, 27, 51, 25, 31, 5, 19, 34, 36, 28, 5, 12, 15, 19, 30, 44, 41, 40, 34, 33, 45, 44, 38, 50, 47, 68, 48, 38, 6, 76, 43, 59, 61, 51, 54, 76, 50, 61, 59, 54, 64, 64, 68, 66, 76, 60, 58, 76, 41, 62, 45, 70, 76, 83, 79, 87, 61, 83, 72, 92, 79, 58, 64, 87, 48, 77, 84, 76, 70, 48, 86, 81, 93, 88, 72, 88, 87, 96, 95, 97, 88, 102, 101, 96, 111] 0

k\_1000 266

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_6.sm case j12034\_6.sm

32 713.7128038406372 s [118, 123] 18.0 [0, 0, 0, 0, 2, 8, 8, 2, 4, 9, 22, 4, 4, 17, 4, 4, 30, 15, 17, 28, 10, 9, 17, 41, 20, 15, 10, 15, 12, 24, 10, 24, 11, 24, 9, 11, 35, 27, 40, 37, 29, 42, 53, 27, 58, 62, 38, 35, 10, 12, 45, 24, 34, 32, 19, 50, 43, 42, 45, 40, 43, 17, 51, 34, 24, 2, 51, 45, 28, 58, 64, 39, 38, 19, 32, 46, 53, 51, 18, 41, 32, 66, 53, 62, 54, 45, 48, 53, 56, 63, 64, 61, 53, 58, 66, 57, 72, 54, 64, 75, 75, 66, 68, 59, 72, 72, 70, 72, 78, 68, 78, 86, 94, 82, 80, 74, 104, 82, 90, 83, 108, 118] 0

k\_1000 267

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_7.sm case j12034\_7.sm

30 718.245543718338 s [116, 124] 10.476190476190476 [0, 0, 0, 0, 7, 8, 7, 8, 19, 10, 3, 16, 17, 3, 30, 26, 8, 28, 18, 16, 36, 25, 16, 43, 20, 55, 19, 31, 44, 51, 11, 37, 17, 18, 38, 13, 37, 44, 22, 46, 30, 17, 8, 29, 40, 50, 36, 38, 48, 30, 30, 26, 57, 39, 26, 60, 37, 52, 54, 28, 47, 40, 63, 19, 72, 20, 43, 51, 52, 63, 56, 55, 55, 59, 28, 43, 65, 65, 65, 65, 71, 71, 55, 50, 65, 59, 65, 68, 66, 71, 75, 75, 79, 81, 75, 72, 75, 78, 78, 89, 80, 71, 81, 84, 80, 75, 83, 83, 81, 84, 93, 88, 99, 103, 89, 93, 90, 99, 108, 106, 102, 116] 0

k\_1000 268

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_8.sm case j12034\_8.sm

26 708.6857590675354 s [105, 108] 17.97752808988764 [0, 0, 0, 0, 4, 1, 8, 4, 4, 8, 18, 8, 13, 1, 18, 10, 29, 35, 15, 1, 31, 24, 7, 19, 35, 15, 35, 30, 10, 16, 7, 43, 22, 17, 18, 52, 18, 18, 20, 28, 36, 17, 18, 36, 27, 19, 26, 26, 43, 18, 22, 54, 30, 54, 30, 45, 24, 38, 10, 52, 27, 31, 54, 58, 28, 34, 45, 45, 38, 26, 47, 50, 40, 37, 58, 47, 48, 55, 62, 48, 56, 64, 59, 50, 59, 63, 58, 64, 70, 74, 45, 70, 68, 64, 74, 74, 68, 74, 77, 80, 75, 79, 67, 88, 72, 85, 80, 88, 58, 75, 92, 76, 89, 80, 70, 83, 90, 89, 96, 96, 92, 105] 0

k\_1000 269

opm 94

the random choice case path in j120 ./rcpsp/j120.sm/j12034\_9.sm case j12034\_9.sm

23 730.1674056053162 s [109, 134] 15.957446808510639 [0, 0, 0, 0, 9, 4, 6, 11, 4, 23, 28, 16, 6, 4, 30, 24, 11, 19, 21, 6, 24, 12, 28, 10, 30, 38, 11, 38, 45, 17, 27, 28, 33, 8, 43, 39, 25, 8, 36, 9, 16, 18, 33, 21, 51, 47, 33, 17, 40, 52, 60, 45, 45, 39, 20, 52, 36, 25, 18, 38, 58, 67, 30, 58, 58, 50, 66, 21, 65, 45, 45, 78, 39, 21, 47, 68, 60, 66, 57, 66, 50, 68, 72, 76, 36, 50, 65, 51, 68, 81, 68, 75, 55, 70, 84, 81, 77, 84, 81, 84, 84, 88, 77, 84, 91, 82, 88, 77, 88, 93, 88, 55, 92, 99, 100, 105, 93, 95, 88, 106, 100, 109] 0

k\_1000 270

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_1.sm case j12035\_1.sm

4 47.15416097640991 s [87, 94] 0.0 [0, 0, 0, 0, 10, 9, 9, 18, 10, 21, 17, 17, 10, 20, 18, 21, 10, 11, 21, 30, 17, 22, 21, 29, 21, 25, 15, 10, 18, 30, 29, 39, 45, 16, 21, 32, 34, 9, 28, 20, 32, 25, 28, 20, 30, 40, 31, 44, 37, 25, 23, 33, 41, 23, 52, 15, 36, 39, 25, 48, 30, 40, 42, 48, 46, 40, 32, 53, 36, 53, 52, 50, 57, 45, 56, 50, 45, 61, 18, 56, 63, 32, 35, 61, 48, 64, 62, 31, 34, 40, 65, 43, 65, 49, 59, 54, 62, 52, 49, 60, 63, 60, 67, 58, 54, 69, 36, 68, 69, 57, 71, 79, 70, 79, 73, 69, 68, 73, 82, 81, 78, 87] 0

k\_1000 271

opm 86

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_10.sm case j12035\_10.sm

40 716.9847629070282 s [90, 156] 4.651162790697675 [0, 0, 0, 0, 5, 5, 4, 10, 12, 15, 4, 4, 4, 15, 5, 8, 22, 8, 11, 21, 20, 10, 16, 18, 18, 23, 25, 18, 21, 24, 10, 28, 4, 31, 14, 29, 38, 23, 24, 30, 22, 31, 30, 14, 30, 16, 36, 16, 43, 16, 20, 24, 23, 43, 26, 29, 46, 44, 37, 34, 26, 52, 28, 31, 44, 42, 38, 47, 39, 29, 28, 47, 37, 54, 47, 51, 39, 40, 39, 37, 43, 52, 29, 58, 48, 40, 58, 49, 59, 50, 58, 51, 60, 62, 60, 52, 57, 59, 62, 58, 63, 60, 68, 65, 67, 68, 62, 58, 67, 74, 66, 67, 70, 77, 76, 79, 80, 70, 82, 88, 79, 90] 0

k\_1000 272

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_2.sm case j12035\_2.sm

36 697.7297959327698 s [128, 158] 15.315315315315313 [0, 0, 0, 0, 6, 25, 16, 8, 18, 26, 7, 30, 25, 30, 22, 37, 6, 14, 8, 20, 40, 36, 6, 44, 36, 54, 14, 12, 30, 29, 17, 22, 31, 39, 42, 23, 46, 48, 17, 27, 32, 7, 47, 44, 40, 61, 51, 51, 28, 41, 40, 52, 32, 32, 37, 47, 22, 62, 51, 18, 23, 28, 54, 25, 26, 55, 30, 66, 63, 57, 57, 48, 68, 55, 70, 68, 55, 62, 70, 62, 77, 46, 78, 47, 61, 66, 80, 72, 43, 74, 77, 63, 66, 72, 80, 68, 86, 91, 68, 78, 76, 87, 92, 76, 83, 84, 91, 91, 93, 85, 101, 93, 97, 91, 98, 103, 106, 112, 103, 121, 98, 128] 0

k\_1000 273

opm 77

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_3.sm case j12035\_3.sm

37 711.3859601020813 s [89, 117] 15.584415584415584 [0, 0, 0, 0, 7, 5, 1, 9, 5, 8, 8, 23, 19, 30, 14, 14, 5, 9, 14, 3, 18, 31, 9, 15, 19, 23, 15, 18, 17, 23, 17, 18, 26, 11, 28, 28, 3, 8, 22, 17, 15, 22, 35, 24, 29, 29, 32, 38, 40, 35, 26, 35, 22, 41, 24, 34, 42, 40, 46, 43, 43, 43, 52, 41, 25, 38, 50, 43, 38, 43, 25, 28, 32, 46, 19, 28, 50, 39, 42, 48, 58, 50, 57, 54, 53, 35, 50, 65, 35, 1, 70, 40, 56, 33, 49, 58, 70, 23, 54, 56, 66, 62, 59, 59, 60, 65, 65, 69, 63, 58, 69, 72, 67, 74, 69, 72, 74, 74, 78, 81, 78, 89] 0

k\_1000 274

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_4.sm case j12035\_4.sm

23 704.5926764011383 s [114, 147] 12.871287128712872 [0, 0, 0, 0, 3, 5, 8, 10, 8, 5, 8, 17, 12, 9, 16, 8, 26, 16, 6, 5, 51, 36, 26, 34, 10, 12, 6, 31, 17, 16, 9, 19, 37, 40, 22, 14, 22, 22, 17, 34, 48, 33, 15, 42, 17, 23, 26, 24, 43, 37, 8, 12, 41, 38, 51, 43, 46, 41, 43, 17, 42, 25, 70, 56, 9, 24, 66, 50, 25, 38, 42, 43, 75, 66, 63, 67, 40, 57, 51, 54, 55, 62, 60, 54, 48, 71, 36, 75, 70, 65, 31, 55, 83, 71, 71, 55, 85, 83, 70, 70, 75, 75, 60, 79, 76, 87, 78, 87, 85, 87, 89, 97, 97, 101, 98, 99, 89, 69, 103, 106, 98, 114] 0

k\_1000 275

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_5.sm case j12035\_5.sm

28 742.580629825592 s [106, 114] 15.217391304347828 [0, 0, 0, 0, 5, 2, 10, 10, 6, 15, 5, 49, 5, 14, 37, 71, 14, 27, 22, 12, 14, 14, 22, 12, 2, 23, 2, 14, 15, 25, 46, 6, 15, 15, 18, 28, 29, 17, 28, 21, 21, 17, 28, 37, 63, 18, 24, 33, 40, 25, 24, 31, 34, 38, 34, 43, 35, 49, 31, 22, 29, 42, 25, 70, 54, 18, 39, 27, 21, 60, 30, 43, 68, 47, 68, 30, 40, 49, 51, 40, 36, 47, 60, 58, 49, 27, 60, 57, 41, 65, 70, 73, 55, 76, 60, 69, 49, 64, 81, 77, 75, 73, 70, 83, 64, 77, 76, 79, 87, 79, 76, 84, 90, 84, 83, 94, 79, 94, 85, 97, 102, 106] 0

k\_1000 276

opm 86

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_6.sm case j12035\_6.sm

49 716.2863714694977 s [89, 97] 3.488372093023256 [0, 0, 0, 0, 3, 3, 3, 5, 7, 7, 8, 12, 13, 7, 12, 13, 19, 8, 16, 3, 12, 19, 14, 31, 12, 24, 19, 10, 24, 21, 3, 21, 5, 3, 21, 14, 16, 25, 22, 10, 24, 31, 39, 13, 33, 35, 12, 49, 31, 47, 38, 14, 21, 39, 35, 48, 24, 22, 34, 27, 52, 13, 56, 41, 30, 58, 33, 43, 32, 57, 40, 41, 40, 43, 59, 30, 39, 47, 27, 17, 42, 49, 34, 50, 55, 40, 47, 51, 43, 34, 24, 58, 59, 41, 59, 62, 50, 49, 58, 56, 58, 55, 54, 68, 64, 58, 71, 51, 49, 66, 72, 69, 69, 71, 70, 77, 77, 73, 64, 87, 76, 89] 0

k\_1000 277

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_7.sm case j12035\_7.sm

36 703.6447107791901 s [100, 125] 1.0101010101010102 [0, 0, 0, 0, 1, 1, 4, 8, 9, 22, 8, 8, 13, 13, 20, 4, 13, 4, 15, 4, 13, 14, 26, 4, 13, 18, 18, 18, 14, 4, 32, 13, 42, 20, 29, 35, 26, 45, 1, 56, 24, 22, 37, 55, 16, 32, 51, 56, 18, 54, 46, 58, 18, 14, 35, 26, 36, 20, 13, 38, 29, 14, 14, 36, 43, 43, 48, 52, 35, 32, 27, 34, 28, 52, 37, 34, 43, 58, 35, 42, 60, 40, 50, 38, 45, 47, 62, 56, 54, 48, 63, 53, 56, 64, 63, 69, 64, 70, 50, 63, 51, 56, 55, 66, 70, 74, 78, 81, 65, 79, 87, 69, 68, 66, 70, 76, 78, 87, 82, 95, 70, 100] 0

k\_1000 278

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_8.sm case j12035\_8.sm

31 721.7899305820465 s [104, 186] 2.9702970297029703 [0, 0, 0, 0, 7, 6, 12, 4, 7, 7, 4, 21, 15, 21, 21, 4, 23, 23, 26, 11, 6, 13, 11, 19, 24, 15, 15, 46, 21, 28, 47, 27, 15, 37, 11, 31, 32, 26, 27, 21, 36, 27, 33, 19, 8, 29, 50, 42, 51, 25, 19, 34, 39, 31, 32, 26, 50, 40, 57, 48, 23, 40, 33, 25, 28, 39, 56, 41, 38, 52, 46, 36, 43, 49, 40, 48, 73, 58, 31, 80, 52, 52, 45, 47, 53, 46, 43, 68, 15, 60, 52, 41, 61, 52, 69, 74, 62, 56, 66, 48, 61, 52, 58, 67, 66, 74, 52, 65, 78, 82, 69, 70, 88, 80, 92, 60, 86, 85, 98, 67, 91, 104] 0

k\_1000 279

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12035\_9.sm case j12035\_9.sm

26 718.4556257724762 s [98, 132] 7.6923076923076925 [0, 0, 0, 0, 10, 9, 11, 12, 19, 13, 4, 12, 10, 16, 11, 16, 25, 20, 10, 18, 20, 32, 16, 24, 22, 14, 23, 20, 31, 23, 25, 20, 13, 29, 33, 10, 30, 26, 34, 33, 17, 27, 35, 23, 19, 23, 37, 27, 11, 23, 33, 14, 34, 37, 39, 31, 41, 43, 18, 30, 40, 28, 34, 38, 31, 46, 34, 48, 41, 50, 54, 41, 43, 39, 47, 53, 48, 51, 47, 49, 59, 59, 54, 54, 59, 58, 60, 60, 51, 53, 51, 64, 62, 60, 60, 64, 65, 69, 68, 68, 67, 60, 68, 65, 74, 72, 82, 88, 77, 85, 77, 60, 69, 77, 88, 87, 86, 87, 90, 91, 94, 98] 0

k\_1000 280

opm 210

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_1.sm case j12036\_1.sm

11 992.8512444496155 s [242, 332] 15.238095238095239 [0, 0, 0, 0, 7, 17, 3, 16, 4, 8, 25, 22, 35, 7, 27, 35, 25, 59, 83, 84, 103, 74, 27, 67, 42, 93, 110, 35, 50, 102, 95, 22, 124, 45, 75, 100, 133, 129, 80, 150, 29, 43, 105, 138, 15, 51, 15, 81, 90, 123, 100, 58, 29, 151, 51, 133, 83, 112, 119, 180, 183, 138, 61, 119, 145, 162, 8, 116, 141, 67, 123, 67, 92, 137, 163, 43, 29, 164, 172, 95, 157, 155, 133, 164, 75, 142, 149, 168, 187, 188, 157, 141, 168, 159, 201, 172, 183, 175, 146, 183, 176, 207, 225, 191, 206, 191, 151, 197, 215, 211, 211, 216, 219, 225, 233, 221, 222, 225, 235, 233, 226, 242] 0

k\_1000 281

opm 216

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_10.sm case j12036\_10.sm

11 1122.9480302333832 s [250, 1577] 15.74074074074074 [0, 0, 0, 4, 12, 25, 123, 25, 40, 16, 9, 126, 12, 131, 47, 53, 62, 18, 75, 21, 26, 31, 22, 134, 134, 62, 55, 64, 36, 79, 143, 13, 87, 46, 33, 141, 97, 148, 107, 37, 97, 65, 79, 105, 57, 107, 144, 117, 144, 154, 140, 173, 111, 90, 153, 50, 133, 84, 24, 73, 16, 107, 164, 144, 54, 57, 159, 170, 88, 159, 53, 33, 163, 173, 88, 38, 148, 55, 162, 73, 117, 134, 180, 166, 95, 171, 166, 190, 182, 194, 190, 173, 173, 203, 75, 203, 191, 208, 212, 201, 217, 222, 218, 191, 154, 199, 206, 212, 222, 228, 224, 208, 237, 234, 238, 232, 213, 232, 242, 243, 241, 250] 0

k\_1000 282

opm 223

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_2.sm case j12036\_2.sm

11 2130.9003224372864 s [258, 370] 15.695067264573993 [0, 0, 3, 0, 4, 5, 6, 23, 16, 51, 4, 59, 80, 30, 30, 60, 87, 143, 15, 18, 96, 89, 21, 30, 87, 96, 77, 39, 64, 103, 45, 51, 23, 85, 99, 112, 6, 45, 76, 108, 54, 137, 115, 112, 21, 6, 55, 99, 102, 152, 159, 141, 121, 143, 106, 124, 106, 148, 122, 66, 139, 124, 162, 138, 112, 150, 113, 129, 133, 133, 37, 159, 151, 67, 45, 71, 128, 166, 176, 171, 162, 198, 168, 168, 159, 182, 188, 169, 154, 178, 182, 208, 204, 179, 192, 138, 213, 204, 210, 166, 220, 177, 172, 221, 213, 226, 228, 200, 220, 237, 216, 241, 228, 184, 239, 231, 247, 252, 225, 254, 248, 258] 0

k\_1000 283

opm 228

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_3.sm case j12036\_3.sm

11 1930.282030582428 s [260, 277] 14.035087719298245 [0, 0, 0, 1, 1, 14, 20, 30, 48, 35, 58, 70, 8, 46, 102, 11, 87, 52, 22, 28, 148, 94, 16, 22, 35, 12, 61, 67, 5, 14, 44, 83, 154, 57, 107, 36, 88, 67, 23, 48, 61, 50, 53, 32, 94, 92, 124, 117, 124, 155, 30, 38, 101, 61, 57, 11, 68, 132, 99, 80, 90, 174, 155, 125, 138, 74, 80, 117, 116, 158, 107, 90, 52, 132, 155, 165, 139, 132, 126, 154, 145, 191, 181, 183, 175, 201, 165, 193, 203, 166, 158, 24, 193, 181, 189, 201, 196, 179, 184, 214, 215, 176, 211, 238, 248, 206, 223, 213, 229, 227, 229, 240, 246, 220, 211, 231, 247, 247, 237, 250, 255, 260] 0

k\_1000 284

opm 235

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_4.sm case j12036\_4.sm

11 1035.5036897659302 s [274, 316] 16.595744680851062 [0, 0, 14, 0, 3, 4, 12, 8, 26, 12, 22, 14, 34, 24, 34, 24, 37, 39, 55, 42, 58, 48, 42, 68, 157, 90, 17, 43, 58, 86, 31, 43, 69, 78, 51, 109, 97, 79, 116, 90, 98, 92, 125, 100, 107, 131, 46, 115, 150, 133, 128, 145, 69, 130, 165, 157, 177, 173, 171, 4, 125, 183, 121, 110, 132, 189, 142, 52, 151, 192, 201, 138, 110, 196, 183, 208, 173, 206, 167, 80, 120, 126, 207, 196, 151, 157, 186, 208, 176, 116, 65, 211, 212, 220, 177, 224, 213, 226, 227, 223, 237, 238, 231, 231, 245, 165, 231, 247, 189, 241, 253, 219, 245, 253, 257, 262, 257, 265, 247, 268, 263, 274] 0

k\_1000 285

opm 228

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_5.sm case j12036\_5.sm

11 1157.5965673923492 s [261, 1279] 14.473684210526317 [0, 0, 1, 0, 36, 8, 104, 1, 11, 9, 36, 51, 9, 67, 28, 60, 16, 60, 14, 45, 78, 8, 106, 81, 91, 66, 36, 8, 106, 110, 11, 86, 73, 52, 77, 45, 84, 45, 82, 110, 93, 135, 16, 76, 101, 108, 113, 17, 73, 130, 118, 27, 120, 108, 17, 68, 135, 82, 126, 26, 87, 156, 87, 26, 141, 155, 22, 171, 147, 145, 147, 181, 183, 168, 76, 193, 178, 156, 151, 160, 93, 100, 100, 183, 186, 177, 136, 201, 187, 220, 120, 203, 192, 151, 193, 230, 208, 230, 192, 162, 155, 191, 179, 179, 196, 206, 222, 238, 218, 228, 233, 165, 239, 210, 241, 249, 244, 216, 251, 248, 222, 261] 0

k\_1000 286

opm 225

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_6.sm case j12036\_6.sm

11 1654.956065416336 s [258, 265] 14.666666666666666 [0, 24, 0, 0, 4, 4, 10, 6, 49, 17, 33, 33, 47, 28, 61, 6, 15, 7, 18, 74, 41, 15, 15, 39, 24, 62, 21, 29, 10, 68, 7, 70, 51, 81, 82, 43, 84, 32, 37, 75, 40, 56, 62, 118, 74, 109, 92, 55, 98, 75, 92, 98, 21, 94, 77, 84, 78, 66, 101, 109, 51, 85, 101, 116, 114, 123, 106, 102, 110, 163, 127, 170, 158, 119, 135, 145, 110, 180, 154, 18, 188, 162, 180, 190, 128, 137, 172, 196, 145, 173, 178, 129, 119, 199, 150, 123, 173, 232, 225, 206, 199, 225, 216, 216, 216, 234, 206, 238, 239, 224, 234, 233, 243, 246, 243, 247, 250, 247, 246, 254, 252, 258] 0

k\_1000 287

opm 208

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_7.sm case j12036\_7.sm

11 1272.706910610199 s [231, 1065] 11.057692307692307 [0, 0, 0, 2, 14, 8, 2, 50, 59, 14, 31, 38, 5, 24, 15, 46, 52, 52, 61, 69, 46, 15, 74, 38, 24, 7, 30, 61, 22, 7, 47, 31, 65, 76, 71, 80, 87, 108, 98, 84, 30, 94, 51, 126, 46, 100, 74, 96, 98, 100, 59, 87, 108, 118, 77, 24, 87, 76, 74, 110, 77, 96, 127, 107, 127, 117, 118, 118, 79, 136, 138, 128, 140, 151, 158, 148, 148, 140, 150, 159, 163, 110, 178, 170, 163, 136, 127, 147, 180, 138, 178, 186, 115, 184, 117, 180, 189, 172, 198, 204, 97, 127, 131, 201, 152, 160, 213, 193, 170, 127, 187, 203, 220, 221, 211, 193, 140, 221, 228, 221, 230, 231] 0

k\_1000 288

opm 172

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_8.sm case j12036\_8.sm

11 975.5055918693542 s [201, 216] 16.86046511627907 [0, 0, 0, 0, 14, 4, 77, 3, 83, 32, 19, 33, 11, 39, 8, 41, 10, 15, 48, 64, 53, 46, 10, 20, 68, 22, 50, 5, 58, 20, 15, 86, 29, 33, 23, 46, 56, 58, 86, 64, 94, 39, 61, 53, 77, 67, 68, 29, 6, 61, 66, 95, 83, 99, 78, 73, 94, 103, 65, 77, 107, 117, 113, 125, 99, 133, 120, 120, 95, 113, 144, 120, 91, 105, 110, 151, 135, 115, 126, 81, 129, 151, 139, 164, 135, 145, 160, 144, 121, 151, 156, 160, 126, 129, 158, 171, 167, 140, 162, 170, 140, 156, 174, 170, 177, 158, 133, 187, 183, 189, 182, 179, 182, 165, 175, 191, 175, 197, 198, 197, 187, 201] 0

k\_1000 289

opm 220

the random choice case path in j120 ./rcpsp/j120.sm/j12036\_9.sm case j12036\_9.sm

11 1316.9647171497345 s [259, 2559] 17.727272727272727 [0, 0, 0, 6, 19, 10, 22, 28, 41, 26, 25, 42, 43, 10, 33, 57, 44, 62, 61, 103, 16, 80, 56, 65, 81, 87, 26, 19, 50, 33, 88, 55, 97, 45, 101, 88, 107, 101, 66, 128, 77, 114, 48, 112, 142, 72, 93, 133, 137, 31, 19, 153, 70, 121, 62, 109, 81, 110, 146, 98, 131, 86, 90, 43, 153, 148, 77, 98, 133, 98, 160, 123, 156, 159, 168, 169, 169, 136, 179, 185, 197, 113, 190, 185, 162, 140, 112, 168, 177, 116, 190, 192, 162, 141, 187, 171, 200, 170, 113, 179, 207, 208, 211, 239, 216, 240, 156, 202, 209, 202, 223, 229, 213, 219, 201, 219, 239, 229, 249, 247, 230, 259] 0

k\_1000 290

opm 145

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_1.sm case j12037\_1.sm

13 710.2620997428894 s [166, 553] 14.482758620689657 [0, 0, 0, 0, 8, 8, 40, 46, 26, 8, 17, 57, 8, 26, 27, 27, 11, 16, 50, 63, 36, 46, 69, 11, 55, 19, 16, 34, 19, 42, 34, 16, 21, 51, 28, 27, 28, 36, 60, 75, 75, 89, 84, 45, 60, 20, 104, 62, 50, 39, 60, 33, 39, 68, 10, 56, 69, 84, 99, 79, 89, 68, 100, 54, 83, 92, 90, 73, 106, 72, 107, 114, 110, 120, 50, 72, 61, 110, 25, 116, 75, 113, 81, 92, 88, 117, 73, 124, 126, 99, 101, 114, 100, 127, 118, 122, 103, 107, 121, 117, 112, 129, 124, 133, 129, 124, 133, 106, 133, 134, 142, 142, 136, 139, 151, 152, 156, 146, 157, 157, 152, 166] 0

k\_1000 291

opm 132

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_10.sm case j12037\_10.sm

15 738.1738774776459 s [148, 211] 12.121212121212121 [0, 25, 0, 0, 6, 36, 10, 20, 14, 14, 29, 6, 1, 2, 16, 29, 16, 23, 36, 43, 5, 16, 34, 25, 6, 36, 39, 25, 48, 55, 23, 48, 58, 57, 47, 64, 64, 69, 1, 32, 3, 34, 69, 62, 79, 66, 85, 41, 26, 35, 56, 82, 52, 92, 46, 10, 56, 72, 74, 48, 72, 78, 65, 41, 69, 46, 84, 74, 59, 97, 98, 62, 98, 94, 103, 90, 101, 109, 49, 108, 88, 94, 103, 65, 90, 104, 112, 108, 112, 115, 101, 94, 116, 77, 58, 121, 119, 79, 126, 108, 110, 123, 133, 112, 114, 118, 130, 133, 133, 67, 142, 111, 136, 133, 123, 137, 142, 142, 138, 145, 145, 148] 0

k\_1000 292

opm 145

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_2.sm case j12037\_2.sm

23 744.5784831047058 s [159, 181] 9.655172413793103 [0, 0, 0, 0, 20, 10, 10, 34, 19, 22, 23, 37, 31, 20, 44, 45, 33, 39, 55, 57, 41, 10, 62, 46, 66, 10, 51, 32, 21, 32, 53, 63, 1, 53, 69, 63, 69, 42, 79, 21, 53, 6, 75, 67, 57, 73, 42, 82, 85, 10, 54, 13, 90, 20, 52, 54, 47, 106, 82, 19, 100, 109, 90, 77, 94, 97, 79, 62, 34, 103, 73, 65, 114, 76, 77, 94, 66, 109, 31, 116, 112, 87, 99, 106, 121, 85, 75, 100, 106, 115, 131, 100, 124, 118, 84, 103, 131, 107, 139, 116, 122, 109, 37, 126, 139, 115, 122, 150, 132, 136, 148, 148, 128, 144, 144, 151, 152, 151, 153, 157, 150, 159] 0

k\_1000 293

opm 139

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_3.sm case j12037\_3.sm

19 724.9161601066589 s [158, 212] 13.66906474820144 [0, 0, 0, 0, 6, 5, 10, 12, 10, 18, 3, 6, 3, 11, 24, 16, 18, 28, 18, 26, 28, 22, 26, 35, 5, 27, 37, 12, 6, 37, 47, 53, 37, 40, 49, 11, 43, 61, 14, 40, 72, 59, 28, 49, 86, 64, 34, 61, 69, 81, 49, 90, 56, 79, 96, 56, 95, 69, 72, 87, 79, 66, 66, 81, 92, 98, 23, 102, 89, 48, 79, 99, 90, 102, 104, 102, 111, 81, 120, 122, 96, 122, 106, 102, 111, 69, 111, 112, 103, 94, 127, 138, 122, 115, 36, 103, 108, 113, 133, 144, 112, 133, 128, 120, 145, 128, 122, 137, 129, 119, 140, 145, 148, 145, 140, 148, 146, 139, 152, 151, 152, 158] 0

k\_1000 294

opm 162

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_4.sm case j12037\_4.sm

11 1017.0655324459076 s [184, 215] 13.580246913580247 [0, 0, 0, 12, 6, 6, 10, 13, 13, 23, 85, 42, 39, 21, 45, 53, 47, 11, 20, 23, 33, 81, 51, 20, 11, 57, 66, 57, 32, 29, 73, 55, 75, 74, 29, 37, 44, 93, 44, 40, 35, 42, 25, 64, 79, 55, 72, 63, 103, 120, 132, 61, 93, 97, 53, 87, 53, 113, 35, 70, 63, 80, 89, 68, 74, 97, 86, 103, 107, 122, 103, 131, 86, 107, 115, 131, 139, 123, 116, 118, 122, 43, 123, 58, 111, 68, 130, 140, 140, 113, 94, 136, 139, 56, 144, 57, 136, 118, 150, 137, 81, 142, 143, 152, 142, 158, 131, 155, 64, 156, 155, 163, 158, 165, 166, 151, 172, 165, 179, 172, 107, 184] 0

k\_1000 295

opm 204

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_5.sm case j12037\_5.sm

11 636.6985764503479 s [225, 232] 10.294117647058822 [0, 10, 0, 0, 10, 5, 83, 29, 35, 21, 49, 18, 43, 19, 44, 26, 44, 14, 53, 61, 36, 58, 21, 36, 86, 90, 28, 60, 97, 64, 40, 70, 91, 61, 48, 48, 70, 78, 81, 68, 29, 101, 101, 70, 108, 36, 48, 81, 81, 94, 91, 99, 74, 56, 91, 109, 77, 58, 18, 75, 108, 114, 119, 118, 60, 10, 115, 124, 116, 123, 134, 126, 126, 114, 135, 136, 118, 140, 154, 36, 145, 154, 165, 135, 143, 127, 178, 154, 160, 170, 174, 153, 187, 164, 187, 170, 160, 174, 188, 188, 195, 144, 167, 159, 184, 191, 191, 178, 199, 203, 153, 187, 206, 203, 184, 195, 204, 207, 216, 215, 209, 225] 0

k\_1000 296

opm 163

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_6.sm case j12037\_6.sm

11 972.4912223815918 s [189, 273] 15.950920245398773 [0, 0, 0, 5, 2, 16, 2, 11, 18, 10, 10, 11, 47, 18, 19, 22, 5, 1, 75, 13, 27, 54, 34, 25, 43, 87, 2, 25, 35, 34, 16, 43, 14, 24, 131, 25, 32, 64, 136, 36, 73, 87, 31, 62, 71, 93, 81, 54, 101, 40, 110, 63, 52, 35, 65, 85, 78, 112, 123, 73, 117, 44, 124, 116, 125, 136, 65, 64, 106, 141, 47, 140, 71, 144, 96, 82, 86, 75, 97, 85, 97, 106, 145, 103, 147, 151, 113, 96, 55, 135, 90, 135, 106, 121, 126, 83, 116, 131, 87, 159, 144, 137, 148, 153, 165, 148, 143, 169, 155, 144, 92, 155, 169, 169, 165, 177, 168, 161, 125, 169, 180, 189] 0

k\_1000 297

opm 160

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_7.sm case j12037\_7.sm

11 1017.4559214115143 s [188, 238] 17.5 [0, 0, 0, 11, 14, 1, 10, 15, 2, 29, 35, 11, 25, 15, 35, 20, 20, 10, 1, 2, 24, 24, 22, 20, 35, 41, 51, 58, 28, 45, 32, 65, 81, 67, 26, 46, 57, 63, 66, 53, 37, 82, 35, 45, 87, 55, 74, 82, 94, 76, 93, 85, 104, 76, 82, 104, 76, 84, 60, 112, 94, 74, 110, 117, 120, 121, 126, 100, 47, 130, 133, 85, 123, 132, 144, 133, 143, 135, 60, 134, 104, 149, 55, 151, 101, 110, 112, 156, 133, 41, 113, 90, 114, 91, 161, 86, 153, 25, 52, 166, 109, 134, 117, 168, 138, 174, 168, 174, 140, 144, 147, 149, 156, 174, 180, 149, 158, 178, 183, 187, 183, 188] 0

k\_1000 298

opm 178

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_8.sm case j12037\_8.sm

11 1108.4778831005096 s [207, 266] 16.292134831460675 [0, 0, 0, 0, 16, 6, 14, 18, 44, 20, 35, 37, 16, 19, 20, 14, 47, 9, 22, 11, 27, 54, 28, 48, 70, 36, 60, 29, 47, 75, 19, 78, 83, 36, 49, 50, 58, 103, 113, 60, 118, 102, 58, 44, 88, 63, 112, 88, 58, 76, 29, 68, 120, 85, 107, 50, 81, 108, 44, 59, 59, 53, 30, 110, 88, 70, 95, 126, 127, 93, 116, 84, 131, 129, 98, 102, 100, 108, 141, 138, 119, 126, 98, 110, 66, 36, 137, 126, 141, 120, 144, 143, 131, 143, 151, 159, 133, 149, 160, 163, 154, 153, 168, 167, 163, 154, 170, 178, 164, 177, 177, 181, 184, 177, 182, 193, 191, 168, 195, 140, 201, 207] 0

k\_1000 299

opm 142

the random choice case path in j120 ./rcpsp/j120.sm/j12037\_9.sm case j12037\_9.sm

14 764.0265069007874 s [160, 180] 12.676056338028168 [0, 0, 0, 0, 3, 3, 10, 15, 19, 8, 30, 5, 8, 10, 9, 5, 28, 8, 33, 83, 7, 92, 34, 22, 57, 66, 16, 40, 41, 20, 28, 3, 57, 69, 14, 51, 61, 24, 32, 40, 63, 53, 20, 40, 46, 71, 49, 14, 87, 17, 46, 55, 31, 52, 44, 40, 61, 88, 67, 87, 78, 62, 78, 31, 42, 57, 52, 94, 97, 69, 100, 98, 61, 130, 44, 118, 25, 82, 95, 87, 120, 102, 75, 97, 105, 112, 74, 86, 49, 58, 111, 79, 93, 105, 50, 85, 111, 92, 90, 127, 132, 121, 137, 124, 122, 99, 142, 111, 120, 124, 138, 136, 133, 132, 144, 138, 151, 142, 147, 148, 157, 160] 0

k\_1000 300

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_1.sm case j12038\_1.sm

22 736.09912276268 s [129, 140] 19.444444444444446 [0, 0, 0, 0, 10, 5, 15, 11, 15, 15, 15, 20, 19, 62, 15, 11, 7, 21, 31, 5, 54, 20, 10, 36, 48, 24, 7, 19, 51, 60, 68, 37, 10, 74, 19, 19, 28, 47, 60, 19, 30, 14, 9, 13, 27, 74, 77, 21, 42, 89, 21, 51, 30, 50, 23, 93, 27, 48, 28, 49, 72, 63, 42, 38, 38, 60, 24, 60, 10, 84, 44, 87, 89, 58, 31, 72, 68, 64, 45, 71, 78, 68, 78, 57, 73, 38, 75, 93, 82, 12, 84, 71, 81, 101, 84, 78, 52, 107, 61, 92, 84, 94, 96, 92, 94, 102, 95, 94, 102, 105, 101, 111, 115, 96, 100, 110, 110, 103, 108, 119, 119, 129] 0

k\_1000 301

opm 140

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_10.sm case j12038\_10.sm

11 835.4971787929535 s [157, 157] 12.142857142857142 [0, 0, 0, 0, 1, 7, 5, 10, 16, 17, 25, 12, 25, 6, 20, 21, 20, 37, 34, 1, 6, 47, 24, 28, 39, 52, 28, 13, 64, 35, 42, 56, 37, 38, 53, 58, 45, 41, 64, 69, 52, 38, 60, 67, 68, 8, 75, 70, 68, 33, 17, 75, 28, 48, 75, 35, 52, 46, 75, 77, 75, 76, 58, 84, 30, 80, 60, 8, 56, 91, 83, 76, 21, 53, 85, 83, 99, 93, 101, 92, 97, 89, 93, 110, 84, 103, 109, 117, 116, 83, 103, 110, 109, 117, 119, 101, 99, 121, 124, 119, 109, 131, 127, 127, 126, 137, 126, 136, 137, 131, 128, 137, 135, 130, 144, 144, 142, 144, 153, 149, 145, 157] 0

k\_1000 302

opm 124

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_2.sm case j12038\_2.sm

23 728.3166260719299 s [139, 147] 12.096774193548388 [0, 0, 0, 0, 3, 9, 4, 3, 4, 17, 21, 5, 22, 23, 21, 30, 9, 25, 27, 14, 9, 15, 13, 30, 17, 23, 27, 54, 37, 20, 33, 28, 35, 44, 36, 55, 36, 10, 49, 16, 55, 36, 51, 32, 58, 14, 39, 40, 25, 69, 69, 24, 44, 62, 45, 65, 70, 49, 46, 66, 66, 19, 69, 46, 77, 46, 69, 44, 73, 80, 46, 87, 77, 80, 75, 76, 66, 95, 61, 47, 86, 91, 82, 86, 82, 84, 91, 53, 101, 87, 99, 92, 100, 102, 95, 104, 90, 102, 104, 106, 112, 113, 106, 75, 119, 114, 87, 109, 114, 115, 111, 113, 114, 119, 118, 121, 128, 125, 130, 130, 125, 139] 0

k\_1000 303

opm 155

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_3.sm case j12038\_3.sm

19 689.9627821445465 s [157, 213] 1.2903225806451613 [0, 0, 0, 0, 10, 18, 24, 9, 34, 19, 34, 9, 37, 34, 37, 38, 10, 14, 14, 53, 12, 48, 38, 21, 9, 63, 59, 44, 22, 44, 45, 12, 42, 19, 68, 24, 68, 38, 87, 26, 28, 78, 32, 49, 28, 62, 61, 78, 67, 70, 32, 87, 54, 52, 91, 91, 45, 54, 29, 29, 80, 58, 65, 72, 96, 58, 76, 84, 94, 84, 82, 72, 77, 89, 102, 70, 25, 99, 4, 109, 57, 109, 119, 118, 92, 112, 128, 115, 110, 120, 128, 84, 131, 18, 105, 119, 101, 122, 122, 125, 110, 101, 112, 125, 127, 131, 131, 134, 115, 130, 135, 143, 129, 140, 135, 141, 137, 146, 147, 148, 148, 157] 0

k\_1000 304

opm 140

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_4.sm case j12038\_4.sm

14 691.9798090457916 s [164, 229] 17.142857142857142 [0, 0, 0, 0, 5, 11, 16, 8, 26, 17, 33, 12, 40, 89, 32, 14, 14, 49, 11, 50, 40, 15, 49, 45, 54, 12, 24, 17, 34, 60, 80, 20, 27, 58, 50, 50, 52, 63, 78, 104, 15, 93, 33, 34, 52, 60, 47, 79, 71, 87, 55, 24, 67, 86, 89, 111, 71, 68, 75, 110, 45, 79, 122, 79, 21, 41, 71, 69, 50, 104, 24, 66, 96, 124, 126, 37, 100, 100, 111, 83, 111, 112, 26, 118, 79, 27, 113, 112, 114, 109, 101, 133, 116, 136, 126, 119, 93, 113, 111, 123, 118, 132, 132, 141, 134, 135, 132, 147, 147, 141, 136, 135, 155, 140, 147, 142, 148, 144, 157, 156, 151, 164] 0

k\_1000 305

opm 114

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_5.sm case j12038\_5.sm

22 719.8064596652985 s [118, 169] 3.508771929824561 [0, 0, 0, 0, 10, 5, 5, 10, 12, 20, 30, 5, 40, 14, 18, 75, 19, 17, 19, 11, 81, 31, 25, 25, 6, 11, 47, 36, 32, 39, 21, 19, 9, 35, 87, 24, 43, 36, 58, 9, 14, 52, 41, 17, 76, 56, 32, 68, 32, 13, 50, 67, 47, 32, 45, 21, 59, 50, 42, 77, 42, 24, 50, 49, 82, 52, 68, 31, 57, 67, 54, 53, 35, 85, 74, 58, 62, 80, 83, 75, 64, 88, 78, 96, 64, 80, 79, 86, 58, 55, 65, 90, 85, 68, 104, 96, 89, 45, 87, 94, 94, 91, 98, 101, 94, 96, 109, 104, 99, 96, 106, 105, 96, 109, 96, 99, 109, 114, 114, 113, 115, 118] 0

k\_1000 306

opm 122

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_6.sm case j12038\_6.sm

13 655.5248799324036 s [142, 143] 16.39344262295082 [0, 0, 67, 0, 3, 3, 4, 3, 67, 4, 11, 20, 30, 13, 4, 30, 39, 43, 35, 5, 12, 40, 9, 53, 20, 46, 16, 14, 1, 48, 12, 15, 1, 23, 57, 2, 10, 59, 28, 46, 34, 28, 49, 48, 15, 45, 9, 24, 16, 66, 28, 39, 25, 36, 34, 76, 49, 84, 55, 75, 60, 43, 54, 61, 25, 77, 49, 79, 34, 93, 54, 75, 68, 33, 58, 53, 76, 61, 80, 59, 78, 89, 92, 89, 93, 96, 76, 95, 101, 66, 98, 96, 111, 111, 65, 113, 108, 90, 107, 103, 86, 118, 98, 107, 118, 103, 119, 94, 111, 114, 117, 122, 126, 116, 122, 126, 124, 132, 138, 130, 132, 142] 0

k\_1000 307

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_7.sm case j12038\_7.sm

24 739.1675956249237 s [123, 129] 17.142857142857142 [0, 0, 0, 0, 2, 7, 5, 5, 8, 5, 9, 1, 2, 8, 18, 17, 32, 8, 8, 11, 7, 8, 22, 8, 17, 28, 1, 12, 12, 16, 17, 17, 19, 29, 5, 46, 21, 17, 4, 46, 39, 51, 46, 51, 12, 22, 42, 27, 31, 39, 31, 31, 72, 18, 58, 25, 67, 2, 16, 27, 58, 37, 44, 37, 22, 61, 41, 27, 41, 64, 80, 29, 46, 51, 42, 33, 57, 54, 51, 68, 54, 57, 61, 54, 79, 62, 77, 68, 64, 71, 81, 70, 67, 80, 36, 66, 85, 64, 68, 69, 57, 92, 69, 79, 81, 95, 83, 85, 69, 89, 85, 89, 89, 94, 99, 100, 109, 108, 113, 109, 97, 123] 0

k\_1000 308

opm 125

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_8.sm case j12038\_8.sm

16 743.8684167861938 s [142, 1456] 13.600000000000001 [0, 0, 0, 0, 6, 10, 16, 17, 4, 8, 11, 26, 15, 29, 22, 22, 11, 4, 8, 4, 57, 31, 36, 75, 32, 53, 40, 10, 8, 14, 41, 20, 70, 19, 26, 40, 22, 29, 41, 27, 65, 22, 45, 32, 62, 34, 44, 30, 38, 50, 50, 71, 57, 93, 32, 63, 69, 44, 95, 77, 72, 37, 86, 74, 45, 39, 61, 80, 41, 77, 97, 84, 59, 51, 48, 87, 98, 65, 55, 68, 79, 79, 89, 87, 79, 84, 111, 95, 105, 101, 110, 81, 52, 101, 89, 103, 98, 99, 110, 53, 99, 105, 114, 101, 118, 93, 114, 119, 113, 111, 120, 126, 121, 130, 106, 119, 135, 125, 123, 141, 132, 142] 0

k\_1000 309

opm 134

the random choice case path in j120 ./rcpsp/j120.sm/j12038\_9.sm case j12038\_9.sm

19 734.4834887981415 s [156, 163] 16.417910447761194 [0, 0, 0, 0, 5, 10, 9, 9, 17, 20, 25, 17, 25, 26, 13, 10, 28, 10, 30, 42, 31, 25, 13, 30, 5, 45, 34, 41, 56, 49, 62, 51, 69, 41, 32, 15, 47, 34, 5, 69, 56, 56, 60, 25, 51, 34, 53, 68, 41, 66, 71, 75, 18, 79, 66, 73, 79, 31, 75, 71, 78, 88, 90, 73, 60, 89, 88, 80, 59, 55, 42, 89, 95, 93, 103, 67, 95, 103, 86, 54, 102, 104, 112, 112, 95, 98, 104, 84, 102, 113, 80, 105, 111, 113, 117, 47, 113, 121, 115, 84, 115, 122, 128, 117, 124, 90, 136, 130, 128, 125, 140, 130, 138, 127, 138, 144, 130, 140, 146, 153, 122, 156] 0

k\_1000 310

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_1.sm case j12039\_1.sm

39 725.4406819343567 s [104, 141] 9.473684210526317 [0, 0, 0, 0, 8, 11, 8, 5, 15, 13, 5, 11, 14, 14, 22, 5, 15, 5, 24, 20, 31, 13, 6, 20, 43, 29, 15, 17, 6, 31, 44, 33, 40, 35, 40, 50, 9, 16, 34, 54, 36, 24, 27, 59, 50, 32, 19, 26, 29, 31, 43, 18, 72, 54, 36, 30, 51, 24, 61, 60, 43, 80, 10, 60, 73, 55, 9, 42, 56, 44, 36, 29, 33, 64, 67, 52, 50, 38, 62, 65, 37, 64, 47, 69, 74, 51, 74, 35, 71, 58, 56, 60, 77, 73, 69, 76, 83, 69, 79, 86, 62, 77, 69, 72, 84, 78, 72, 74, 95, 86, 82, 94, 81, 90, 96, 88, 79, 97, 98, 98, 95, 104] 0

k\_1000 311

opm 110

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_10.sm case j12039\_10.sm

23 718.2553486824036 s [127, 155] 15.454545454545453 [0, 0, 0, 0, 5, 5, 1, 15, 6, 24, 15, 6, 1, 24, 28, 30, 44, 31, 27, 26, 16, 2, 28, 20, 11, 23, 30, 31, 34, 33, 53, 35, 46, 55, 42, 40, 24, 7, 46, 18, 40, 12, 16, 42, 15, 44, 56, 39, 66, 56, 7, 52, 33, 75, 73, 62, 67, 81, 62, 33, 67, 63, 46, 71, 82, 62, 5, 73, 50, 56, 62, 75, 75, 50, 23, 35, 81, 91, 89, 68, 29, 81, 24, 65, 65, 72, 89, 36, 42, 89, 39, 56, 90, 95, 71, 58, 87, 98, 83, 97, 98, 59, 100, 80, 70, 96, 110, 96, 95, 88, 102, 105, 101, 108, 114, 117, 105, 108, 116, 118, 126, 127] 0

k\_1000 312

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_2.sm case j12039\_2.sm

22 736.5289285182953 s [127, 190] 17.59259259259259 [0, 0, 0, 0, 8, 14, 20, 1, 4, 13, 60, 21, 1, 2, 15, 19, 25, 4, 8, 18, 5, 23, 24, 14, 15, 8, 29, 4, 19, 20, 20, 42, 31, 26, 44, 51, 63, 39, 72, 28, 34, 25, 24, 39, 2, 14, 29, 43, 28, 31, 52, 35, 78, 58, 51, 71, 32, 43, 73, 2, 33, 76, 49, 34, 39, 33, 49, 54, 42, 57, 76, 64, 34, 48, 9, 55, 80, 56, 34, 35, 64, 59, 38, 55, 54, 81, 9, 70, 80, 73, 46, 61, 89, 89, 81, 80, 82, 87, 91, 96, 87, 101, 108, 116, 92, 104, 62, 87, 101, 117, 73, 98, 103, 106, 117, 115, 84, 118, 125, 102, 124, 127] 0

k\_1000 313

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_3.sm case j12039\_3.sm

21 714.8536515235901 s [123, 234] 10.81081081081081 [0, 0, 0, 0, 2, 9, 1, 9, 4, 9, 4, 2, 13, 20, 11, 18, 3, 44, 27, 12, 17, 23, 2, 28, 26, 30, 29, 30, 11, 13, 38, 17, 19, 22, 18, 40, 51, 28, 52, 33, 23, 35, 42, 37, 37, 47, 40, 38, 31, 56, 36, 45, 49, 45, 46, 50, 51, 20, 53, 54, 57, 62, 58, 57, 61, 66, 67, 67, 69, 47, 78, 79, 88, 69, 96, 37, 45, 52, 76, 80, 72, 23, 81, 104, 50, 107, 64, 62, 71, 78, 81, 68, 76, 72, 84, 16, 107, 76, 88, 90, 96, 91, 83, 96, 80, 88, 104, 80, 91, 97, 96, 71, 90, 106, 97, 112, 100, 109, 119, 113, 113, 123] 0

k\_1000 314

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_4.sm case j12039\_4.sm

19 734.846207857132 s [110, 144] 12.244897959183673 [0, 0, 0, 0, 1, 42, 3, 10, 18, 5, 8, 1, 20, 28, 22, 3, 6, 3, 15, 35, 37, 13, 36, 10, 5, 20, 15, 8, 22, 8, 24, 41, 51, 10, 52, 25, 30, 48, 39, 44, 54, 16, 48, 32, 26, 28, 36, 26, 55, 48, 54, 30, 59, 56, 57, 32, 45, 37, 22, 58, 67, 62, 34, 73, 60, 68, 34, 68, 48, 57, 58, 76, 63, 62, 66, 50, 63, 71, 80, 42, 82, 65, 88, 70, 70, 22, 65, 66, 76, 75, 78, 60, 75, 88, 71, 83, 79, 95, 42, 56, 73, 80, 88, 83, 74, 88, 83, 84, 91, 98, 88, 95, 89, 92, 96, 97, 106, 96, 101, 97, 109, 110] 0

k\_1000 315

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_5.sm case j12039\_5.sm

21 708.5341866016388 s [115, 168] 8.49056603773585 [0, 0, 0, 0, 7, 7, 7, 11, 4, 10, 11, 19, 15, 15, 11, 22, 5, 28, 4, 44, 35, 45, 25, 22, 22, 22, 27, 29, 49, 28, 16, 39, 38, 58, 39, 51, 13, 35, 58, 48, 53, 61, 25, 65, 48, 38, 59, 51, 31, 63, 43, 37, 35, 72, 28, 48, 67, 67, 11, 44, 13, 78, 41, 31, 48, 56, 73, 72, 73, 53, 79, 34, 80, 55, 33, 12, 55, 56, 84, 60, 52, 60, 78, 36, 79, 65, 70, 74, 78, 85, 78, 67, 77, 70, 85, 79, 86, 93, 75, 74, 78, 52, 90, 93, 84, 39, 98, 98, 99, 100, 91, 63, 92, 102, 101, 92, 106, 88, 108, 104, 100, 115] 0

k\_1000 316

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_6.sm case j12039\_6.sm

37 732.6679832935333 s [108, 122] 13.684210526315791 [0, 0, 0, 0, 5, 8, 8, 7, 9, 5, 26, 24, 17, 6, 37, 76, 35, 36, 14, 30, 25, 10, 11, 5, 21, 63, 11, 17, 15, 44, 38, 41, 6, 44, 51, 15, 24, 46, 25, 14, 32, 26, 47, 39, 25, 21, 42, 37, 47, 47, 51, 35, 49, 15, 59, 34, 56, 29, 45, 59, 39, 47, 66, 61, 51, 52, 42, 25, 33, 15, 43, 55, 28, 48, 49, 53, 72, 41, 46, 62, 60, 62, 63, 70, 73, 46, 53, 59, 21, 76, 58, 74, 80, 81, 89, 31, 73, 69, 73, 74, 76, 38, 82, 98, 58, 78, 70, 75, 75, 85, 78, 85, 66, 69, 94, 83, 85, 93, 96, 99, 93, 108] 0

k\_1000 317

opm 104

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_7.sm case j12039\_7.sm

38 722.9514672756195 s [115, 131] 10.576923076923077 [0, 0, 0, 0, 9, 4, 49, 11, 9, 10, 17, 17, 11, 25, 10, 19, 15, 25, 25, 18, 16, 11, 32, 15, 18, 33, 32, 19, 25, 21, 31, 35, 22, 41, 30, 31, 31, 34, 29, 25, 35, 29, 37, 47, 43, 43, 36, 46, 42, 44, 19, 33, 41, 35, 50, 36, 41, 39, 56, 19, 46, 50, 46, 56, 49, 51, 50, 60, 59, 67, 65, 66, 71, 53, 59, 55, 65, 77, 62, 70, 60, 66, 50, 76, 63, 73, 73, 75, 76, 86, 85, 91, 75, 81, 91, 84, 86, 84, 68, 78, 55, 88, 96, 68, 86, 86, 89, 92, 91, 92, 97, 99, 99, 93, 97, 107, 100, 97, 109, 110, 102, 115] 0

k\_1000 318

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_8.sm case j12039\_8.sm

26 705.6386320590973 s [111, 234] 15.625 [0, 0, 0, 0, 7, 10, 2, 11, 2, 1, 5, 1, 21, 8, 10, 11, 17, 18, 1, 18, 8, 19, 25, 13, 26, 16, 28, 28, 25, 35, 29, 33, 12, 11, 26, 38, 42, 35, 19, 38, 39, 26, 42, 46, 36, 9, 45, 39, 15, 45, 40, 43, 48, 53, 36, 33, 53, 48, 28, 54, 19, 55, 41, 50, 58, 63, 53, 44, 57, 48, 59, 64, 69, 50, 55, 58, 61, 51, 70, 67, 66, 76, 70, 67, 63, 70, 68, 76, 71, 85, 77, 79, 67, 87, 77, 83, 76, 74, 75, 81, 83, 74, 89, 82, 82, 87, 88, 93, 91, 102, 90, 93, 97, 84, 85, 92, 91, 95, 101, 108, 93, 111] 0

k\_1000 319

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j12039\_9.sm case j12039\_9.sm

30 702.1265711784363 s [101, 213] 9.782608695652174 [0, 0, 0, 0, 4, 11, 3, 13, 3, 13, 4, 4, 4, 5, 20, 17, 4, 13, 3, 25, 14, 16, 20, 7, 24, 7, 9, 9, 17, 16, 25, 10, 27, 30, 35, 36, 39, 11, 10, 25, 19, 24, 30, 5, 29, 21, 58, 52, 17, 34, 84, 22, 12, 35, 55, 47, 48, 44, 62, 37, 44, 35, 71, 83, 54, 63, 67, 30, 45, 29, 53, 34, 46, 28, 57, 57, 37, 46, 41, 60, 46, 17, 59, 56, 65, 65, 49, 44, 52, 25, 28, 80, 67, 63, 73, 72, 56, 71, 49, 67, 67, 75, 78, 76, 80, 75, 85, 54, 80, 80, 58, 85, 90, 88, 86, 94, 92, 84, 98, 86, 96, 101] 0

k\_1000 320

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_1.sm case j1203\_1.sm

32 701.1491799354553 s [87, 96] 8.75 [0, 0, 0, 0, 10, 2, 14, 2, 2, 15, 14, 9, 14, 11, 5, 7, 8, 5, 7, 11, 16, 21, 9, 18, 5, 24, 6, 13, 11, 15, 22, 24, 15, 25, 15, 29, 29, 25, 28, 15, 18, 38, 16, 15, 26, 19, 36, 22, 46, 18, 15, 27, 35, 14, 24, 33, 28, 46, 31, 33, 36, 50, 45, 36, 54, 33, 45, 19, 24, 32, 28, 40, 52, 38, 59, 59, 21, 37, 61, 40, 26, 38, 41, 29, 25, 40, 65, 18, 51, 6, 69, 18, 55, 41, 45, 51, 42, 41, 60, 57, 60, 52, 76, 70, 61, 55, 46, 74, 62, 79, 45, 36, 65, 71, 65, 65, 76, 84, 86, 82, 75, 87] 0

k\_1000 321

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_10.sm case j1203\_10.sm

7 73.33361506462097 s [103, 104] 0.0 [0, 0, 0, 0, 3, 10, 10, 3, 5, 15, 10, 7, 10, 7, 7, 27, 10, 24, 16, 34, 17, 15, 15, 34, 11, 5, 21, 17, 6, 15, 16, 14, 5, 37, 21, 37, 12, 23, 20, 28, 25, 45, 33, 25, 20, 46, 15, 14, 29, 8, 25, 23, 31, 24, 29, 29, 29, 35, 26, 23, 46, 34, 32, 33, 59, 48, 42, 66, 29, 52, 44, 68, 35, 35, 12, 52, 46, 38, 57, 53, 35, 48, 47, 56, 15, 53, 61, 42, 47, 56, 52, 10, 34, 55, 66, 59, 35, 66, 34, 45, 45, 68, 48, 73, 71, 60, 74, 64, 70, 79, 79, 78, 73, 52, 78, 89, 91, 65, 87, 94, 41, 103] 0

k\_1000 322

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_2.sm case j1203\_2.sm

1 13.880269527435303 s [88, 91] 0.0 [0, 0, 0, 0, 8, 6, 17, 6, 17, 1, 4, 17, 4, 27, 27, 4, 34, 6, 11, 35, 14, 14, 1, 41, 34, 4, 48, 17, 27, 27, 15, 29, 15, 8, 8, 8, 31, 7, 35, 38, 10, 41, 60, 40, 38, 38, 11, 14, 45, 18, 17, 17, 21, 18, 34, 47, 18, 28, 10, 56, 54, 62, 48, 16, 24, 45, 28, 22, 54, 70, 37, 71, 8, 48, 34, 24, 60, 67, 16, 51, 20, 14, 35, 31, 31, 22, 23, 18, 12, 71, 71, 40, 75, 38, 26, 81, 51, 54, 53, 36, 36, 28, 55, 42, 73, 56, 63, 71, 61, 51, 23, 80, 42, 78, 62, 54, 67, 77, 67, 82, 87, 88] 0

k\_1000 323

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_3.sm case j1203\_3.sm

46 725.8571648597717 s [102, 116] 2.0 [0, 0, 0, 0, 9, 3, 8, 8, 14, 10, 9, 10, 31, 10, 9, 16, 15, 10, 28, 18, 14, 9, 19, 9, 16, 24, 21, 16, 18, 20, 15, 15, 20, 18, 14, 26, 16, 3, 27, 18, 40, 20, 10, 24, 36, 29, 17, 46, 26, 24, 25, 28, 18, 36, 24, 36, 20, 32, 21, 46, 23, 37, 16, 56, 37, 9, 21, 21, 19, 29, 36, 21, 47, 23, 49, 26, 50, 41, 41, 15, 28, 55, 24, 30, 18, 35, 16, 30, 49, 14, 51, 46, 41, 3, 54, 15, 32, 56, 31, 63, 47, 54, 63, 64, 46, 46, 24, 66, 32, 19, 76, 74, 84, 61, 88, 91, 55, 83, 38, 99, 91, 102] 0

k\_1000 324

opm 71

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_4.sm case j1203\_4.sm

43 723.1624870300293 s [81, 193] 14.084507042253522 [0, 0, 0, 0, 2, 3, 2, 3, 1, 6, 2, 2, 11, 12, 2, 18, 2, 2, 10, 9, 6, 16, 5, 15, 15, 5, 12, 5, 8, 21, 12, 10, 24, 2, 12, 11, 23, 2, 22, 23, 9, 15, 16, 18, 9, 19, 21, 1, 29, 31, 18, 5, 30, 18, 31, 15, 22, 56, 23, 16, 16, 33, 44, 27, 23, 15, 10, 10, 26, 10, 25, 19, 18, 23, 28, 35, 35, 28, 37, 30, 33, 26, 37, 49, 21, 16, 45, 14, 14, 40, 34, 40, 53, 46, 62, 49, 49, 41, 50, 56, 49, 23, 39, 8, 16, 56, 40, 65, 24, 46, 29, 44, 50, 66, 58, 68, 39, 53, 74, 66, 71, 81] 0

k\_1000 325

opm 84

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_5.sm case j1203\_5.sm

49 723.6208348274231 s [88, 113] 4.761904761904762 [0, 0, 0, 0, 3, 3, 12, 5, 15, 12, 15, 15, 6, 3, 15, 5, 22, 17, 35, 6, 18, 10, 12, 24, 10, 25, 5, 18, 16, 38, 8, 36, 39, 7, 6, 44, 23, 11, 17, 24, 13, 17, 21, 24, 5, 6, 8, 16, 11, 31, 22, 25, 12, 21, 22, 24, 38, 28, 31, 17, 19, 44, 11, 31, 33, 40, 43, 8, 25, 42, 40, 30, 33, 21, 12, 52, 38, 25, 52, 33, 36, 40, 40, 36, 42, 40, 44, 45, 40, 21, 31, 59, 41, 5, 46, 47, 62, 55, 56, 48, 56, 23, 64, 17, 26, 41, 40, 65, 63, 71, 66, 79, 45, 64, 39, 53, 70, 81, 48, 52, 86, 88] 0

k\_1000 326

opm 102

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_6.sm case j1203\_6.sm

12 133.6234848499298 s [102, 121] 0.0 [0, 0, 0, 0, 6, 12, 14, 12, 12, 14, 6, 22, 22, 22, 16, 22, 31, 23, 5, 29, 27, 14, 16, 6, 23, 33, 23, 18, 46, 33, 36, 39, 32, 36, 34, 40, 50, 32, 14, 23, 47, 46, 22, 5, 15, 22, 48, 27, 27, 25, 6, 30, 6, 46, 34, 44, 34, 42, 15, 14, 54, 56, 19, 48, 39, 38, 33, 53, 54, 54, 40, 41, 30, 54, 15, 36, 55, 40, 55, 48, 54, 60, 54, 60, 48, 43, 32, 59, 6, 58, 54, 37, 60, 62, 62, 16, 52, 61, 56, 41, 17, 68, 69, 54, 70, 54, 50, 39, 78, 80, 70, 74, 74, 79, 78, 89, 52, 64, 86, 93, 90, 102] 0

k\_1000 327

opm 93

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_7.sm case j1203\_7.sm

0 12.17441987991333 s [93, 94] 0.0 [0, 0, 0, 0, 4, 4, 15, 10, 14, 14, 4, 10, 15, 17, 5, 22, 5, 1, 15, 15, 14, 23, 3, 32, 3, 17, 3, 4, 23, 25, 24, 21, 6, 26, 30, 23, 26, 31, 26, 32, 24, 24, 27, 5, 38, 42, 32, 29, 40, 10, 22, 7, 22, 24, 34, 27, 39, 39, 17, 48, 30, 8, 45, 10, 6, 55, 22, 12, 26, 40, 21, 27, 31, 32, 31, 47, 37, 19, 31, 50, 48, 56, 15, 60, 40, 35, 42, 17, 42, 50, 62, 55, 51, 50, 56, 42, 56, 44, 26, 57, 40, 47, 57, 54, 56, 42, 70, 64, 64, 70, 74, 67, 82, 39, 74, 84, 42, 78, 65, 82, 91, 93] 0

k\_1000 328

opm 77

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_8.sm case j1203\_8.sm

7 68.77629971504211 s [77, 81] 0.0 [0, 0, 0, 0, 10, 1, 1, 1, 4, 10, 3, 4, 17, 7, 11, 1, 21, 16, 7, 8, 3, 13, 20, 3, 8, 16, 13, 17, 18, 4, 17, 18, 1, 26, 28, 25, 23, 22, 8, 7, 30, 16, 2, 18, 6, 4, 13, 19, 7, 17, 20, 11, 33, 9, 33, 11, 22, 21, 44, 20, 30, 20, 28, 20, 38, 19, 9, 25, 23, 22, 42, 33, 10, 36, 20, 49, 21, 25, 42, 32, 41, 32, 25, 13, 31, 41, 23, 35, 31, 29, 33, 45, 38, 46, 34, 39, 34, 43, 51, 47, 28, 51, 38, 48, 44, 52, 60, 45, 47, 55, 46, 58, 60, 51, 55, 67, 61, 74, 67, 61, 75, 77] 0

k\_1000 329

opm 86

the random choice case path in j120 ./rcpsp/j120.sm/j1203\_9.sm case j1203\_9.sm

9 66.45613288879395 s [86, 128] 0.0 [0, 0, 0, 0, 10, 2, 4, 10, 3, 46, 8, 4, 13, 10, 12, 2, 13, 9, 8, 30, 9, 10, 17, 22, 4, 16, 3, 9, 10, 13, 16, 12, 43, 22, 20, 25, 16, 3, 19, 16, 12, 13, 14, 9, 18, 22, 48, 21, 21, 24, 4, 12, 31, 21, 13, 25, 33, 24, 12, 17, 34, 28, 33, 39, 32, 28, 14, 31, 53, 56, 8, 14, 58, 30, 8, 48, 40, 24, 18, 39, 42, 21, 39, 31, 42, 33, 33, 28, 46, 16, 42, 17, 29, 52, 39, 40, 43, 48, 46, 14, 56, 52, 66, 40, 62, 49, 62, 48, 52, 71, 9, 42, 68, 73, 63, 48, 53, 75, 72, 73, 82, 86] 0

k\_1000 330

opm 81

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_1.sm case j12040\_1.sm

36 722.7157745361328 s [87, 297] 7.4074074074074066 [0, 0, 0, 0, 1, 7, 7, 10, 15, 17, 10, 20, 10, 10, 7, 22, 1, 17, 14, 11, 1, 10, 13, 18, 1, 32, 3, 20, 22, 42, 6, 3, 19, 37, 19, 37, 3, 57, 24, 23, 28, 26, 28, 29, 40, 42, 23, 26, 35, 19, 35, 33, 42, 45, 38, 40, 38, 33, 33, 37, 23, 46, 46, 26, 45, 55, 42, 44, 39, 33, 40, 49, 42, 18, 13, 13, 48, 62, 48, 32, 41, 45, 12, 29, 55, 48, 40, 48, 59, 57, 41, 53, 53, 48, 63, 63, 60, 60, 44, 72, 60, 73, 53, 64, 66, 56, 56, 55, 63, 67, 60, 68, 66, 69, 67, 75, 72, 66, 82, 77, 76, 87] 0

k\_1000 331

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_10.sm case j12040\_10.sm

44 710.3305583000183 s [98, 136] 2.083333333333333 [0, 0, 0, 0, 4, 1, 4, 5, 8, 8, 1, 7, 7, 7, 13, 7, 33, 16, 9, 1, 14, 21, 19, 37, 20, 29, 9, 22, 15, 16, 24, 17, 38, 16, 26, 41, 29, 26, 21, 23, 16, 15, 43, 37, 18, 17, 28, 23, 8, 19, 47, 16, 23, 26, 58, 32, 29, 36, 27, 28, 22, 54, 40, 35, 23, 49, 43, 56, 44, 45, 41, 47, 50, 50, 37, 14, 43, 54, 64, 57, 33, 58, 32, 50, 53, 56, 63, 67, 63, 63, 65, 50, 52, 72, 40, 63, 53, 37, 57, 35, 72, 74, 46, 52, 64, 54, 60, 68, 60, 68, 81, 51, 68, 84, 70, 63, 76, 83, 92, 83, 85, 98] 0

k\_1000 332

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_2.sm case j12040\_2.sm

33 726.9414370059967 s [102, 193] 13.333333333333334 [0, 0, 0, 0, 9, 6, 9, 16, 12, 9, 9, 9, 18, 9, 18, 17, 18, 14, 17, 31, 24, 21, 17, 14, 27, 11, 22, 46, 43, 11, 22, 25, 39, 31, 11, 41, 16, 54, 22, 16, 19, 48, 30, 23, 32, 21, 38, 26, 27, 14, 24, 28, 44, 48, 27, 16, 33, 54, 40, 13, 53, 40, 21, 39, 47, 62, 37, 48, 57, 51, 38, 47, 43, 58, 49, 48, 36, 49, 55, 63, 6, 52, 71, 46, 36, 62, 71, 61, 51, 58, 67, 43, 63, 57, 67, 58, 68, 65, 67, 40, 74, 72, 67, 69, 68, 79, 88, 71, 75, 73, 89, 68, 76, 75, 88, 78, 85, 84, 95, 89, 92, 102] 0

k\_1000 333

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_3.sm case j12040\_3.sm

50 724.7690138816833 s [98, 141] 12.643678160919542 [0, 0, 0, 0, 6, 1, 12, 13, 1, 13, 7, 5, 7, 16, 17, 16, 11, 22, 1, 7, 31, 17, 33, 24, 34, 7, 34, 37, 16, 7, 35, 25, 22, 37, 13, 11, 38, 43, 25, 17, 36, 47, 18, 18, 44, 55, 44, 45, 69, 36, 47, 22, 18, 38, 43, 52, 20, 48, 40, 36, 14, 32, 67, 59, 25, 62, 48, 49, 43, 56, 44, 45, 44, 54, 52, 41, 69, 22, 51, 32, 52, 48, 19, 32, 60, 57, 69, 72, 55, 48, 53, 53, 62, 26, 59, 72, 54, 59, 53, 55, 65, 64, 70, 54, 67, 74, 77, 66, 74, 75, 74, 74, 77, 81, 81, 86, 77, 82, 84, 90, 89, 98] 0

k\_1000 334

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_4.sm case j12040\_4.sm

41 714.2954578399658 s [113, 607] 0.8928571428571428 [0, 0, 0, 0, 6, 9, 13, 9, 16, 9, 21, 18, 21, 18, 7, 23, 6, 18, 16, 42, 15, 21, 6, 20, 25, 50, 23, 20, 27, 16, 24, 16, 30, 21, 33, 36, 33, 50, 27, 30, 34, 34, 28, 42, 40, 23, 27, 42, 34, 38, 43, 36, 33, 40, 32, 55, 33, 51, 50, 43, 50, 45, 45, 50, 54, 24, 25, 51, 59, 64, 53, 64, 40, 56, 69, 74, 68, 61, 71, 63, 28, 60, 43, 51, 67, 77, 81, 54, 61, 59, 75, 70, 77, 54, 80, 86, 58, 61, 66, 66, 78, 91, 75, 81, 66, 75, 89, 82, 80, 67, 87, 93, 95, 84, 88, 91, 100, 87, 105, 98, 103, 113] 0

k\_1000 335

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_5.sm case j12040\_5.sm

45 716.5074706077576 s [108, 126] 6.9306930693069315 [0, 0, 0, 0, 9, 14, 14, 14, 9, 20, 23, 9, 13, 20, 20, 9, 23, 27, 36, 31, 15, 33, 16, 16, 21, 26, 23, 28, 29, 27, 40, 9, 23, 45, 18, 33, 33, 39, 39, 49, 33, 50, 36, 57, 12, 37, 37, 61, 29, 19, 13, 9, 21, 22, 50, 44, 43, 27, 44, 50, 54, 35, 60, 47, 29, 52, 56, 45, 61, 63, 53, 61, 54, 49, 58, 35, 52, 46, 59, 69, 67, 65, 64, 53, 47, 18, 69, 52, 63, 67, 54, 74, 50, 67, 64, 75, 75, 69, 75, 71, 77, 66, 82, 80, 85, 78, 74, 86, 91, 83, 86, 66, 87, 90, 91, 79, 89, 94, 97, 90, 101, 108] 0

k\_1000 336

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_6.sm case j12040\_6.sm

48 717.6805951595306 s [91, 153] 1.1111111111111112 [0, 0, 0, 0, 10, 1, 5, 11, 10, 14, 1, 10, 1, 22, 5, 10, 31, 10, 12, 14, 21, 13, 12, 17, 16, 33, 22, 13, 13, 20, 18, 19, 28, 16, 22, 29, 39, 16, 32, 12, 13, 47, 19, 26, 19, 33, 15, 45, 30, 24, 42, 34, 20, 23, 56, 28, 19, 29, 33, 31, 35, 48, 33, 22, 48, 33, 44, 42, 25, 34, 28, 30, 37, 39, 39, 47, 40, 33, 53, 50, 37, 32, 56, 44, 40, 59, 47, 37, 53, 46, 40, 49, 56, 54, 50, 66, 57, 64, 67, 48, 66, 76, 64, 66, 57, 53, 66, 67, 55, 68, 60, 47, 63, 77, 57, 73, 71, 70, 80, 81, 78, 91] 0

k\_1000 337

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_7.sm case j12040\_7.sm

44 705.7777848243713 s [95, 102] 4.395604395604396 [0, 0, 0, 0, 5, 5, 12, 5, 11, 7, 12, 13, 13, 9, 13, 17, 8, 13, 13, 19, 15, 14, 15, 9, 23, 29, 11, 21, 7, 20, 19, 23, 29, 27, 33, 24, 22, 14, 18, 26, 35, 37, 24, 32, 8, 39, 39, 27, 32, 22, 35, 40, 36, 42, 26, 37, 39, 50, 43, 32, 34, 45, 40, 24, 29, 45, 35, 47, 29, 43, 49, 41, 46, 48, 42, 49, 50, 54, 52, 54, 55, 52, 62, 52, 55, 54, 38, 56, 56, 60, 58, 71, 60, 60, 55, 67, 12, 62, 69, 60, 72, 79, 69, 70, 79, 54, 55, 58, 57, 59, 66, 80, 74, 81, 85, 64, 57, 67, 73, 88, 93, 95] 0

k\_1000 338

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_8.sm case j12040\_8.sm

35 717.9173502922058 s [98, 98] 1.0309278350515463 [0, 0, 0, 0, 3, 3, 2, 2, 8, 7, 6, 7, 3, 11, 18, 11, 8, 8, 6, 18, 25, 11, 18, 23, 27, 13, 37, 16, 22, 27, 2, 27, 25, 11, 30, 32, 17, 30, 15, 26, 36, 32, 30, 34, 38, 42, 43, 34, 24, 44, 38, 48, 37, 43, 19, 46, 43, 49, 48, 43, 17, 41, 49, 39, 49, 41, 56, 53, 71, 50, 49, 44, 52, 65, 64, 53, 53, 56, 64, 61, 50, 58, 60, 27, 65, 58, 65, 56, 66, 63, 65, 50, 72, 57, 76, 72, 55, 73, 71, 64, 83, 62, 81, 52, 58, 61, 77, 89, 81, 75, 67, 77, 79, 92, 88, 78, 86, 83, 93, 94, 82, 98] 0

k\_1000 339

opm 117

the random choice case path in j120 ./rcpsp/j120.sm/j12040\_9.sm case j12040\_9.sm

33 733.7620878219604 s [122, 126] 4.273504273504273 [0, 0, 0, 0, 5, 5, 5, 12, 5, 29, 44, 10, 12, 11, 10, 18, 20, 27, 37, 16, 16, 25, 35, 40, 10, 56, 41, 41, 35, 41, 15, 48, 24, 60, 19, 5, 20, 15, 48, 27, 38, 52, 26, 66, 32, 38, 46, 21, 65, 21, 35, 69, 48, 8, 29, 15, 68, 5, 58, 67, 55, 29, 69, 36, 56, 48, 42, 51, 79, 21, 62, 31, 69, 77, 74, 6, 32, 82, 58, 51, 73, 93, 69, 89, 38, 40, 52, 67, 79, 60, 79, 55, 20, 89, 101, 57, 71, 87, 80, 91, 87, 93, 93, 85, 94, 69, 103, 86, 94, 86, 95, 111, 103, 112, 102, 104, 113, 111, 115, 117, 111, 122] 0

k\_1000 340

opm 127

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_1.sm case j12041\_1.sm

26 725.5873756408691 s [135, 157] 6.299212598425196 [0, 0, 0, 0, 9, 9, 7, 13, 17, 7, 22, 22, 32, 7, 9, 23, 23, 22, 13, 9, 9, 38, 9, 36, 17, 19, 19, 19, 30, 31, 76, 38, 23, 42, 38, 46, 42, 67, 53, 31, 42, 31, 36, 54, 51, 42, 53, 46, 14, 24, 38, 31, 53, 19, 48, 63, 10, 30, 26, 48, 40, 26, 76, 26, 66, 68, 42, 59, 17, 76, 86, 52, 90, 91, 62, 54, 50, 63, 86, 63, 65, 78, 85, 65, 40, 81, 98, 85, 52, 86, 73, 92, 88, 94, 78, 119, 81, 106, 84, 90, 68, 92, 108, 94, 109, 102, 100, 100, 106, 119, 88, 102, 94, 114, 103, 118, 122, 96, 127, 122, 131, 135] 0

k\_1000 341

opm 136

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_10.sm case j12041\_10.sm

25 700.3464827537537 s [144, 150] 5.88235294117647 [0, 0, 0, 9, 2, 9, 13, 5, 18, 19, 25, 13, 13, 14, 28, 47, 25, 14, 34, 16, 35, 25, 20, 18, 34, 20, 57, 28, 37, 24, 34, 42, 14, 42, 24, 34, 40, 37, 5, 51, 48, 59, 45, 59, 40, 42, 68, 27, 58, 17, 42, 27, 57, 16, 71, 68, 47, 50, 61, 51, 66, 30, 40, 74, 60, 66, 45, 76, 34, 64, 79, 64, 97, 75, 76, 84, 33, 46, 84, 52, 53, 45, 37, 76, 55, 80, 92, 58, 48, 98, 88, 95, 102, 92, 74, 101, 75, 127, 101, 102, 104, 98, 95, 108, 105, 108, 102, 104, 117, 106, 104, 113, 121, 121, 117, 83, 127, 128, 134, 137, 134, 144] 0

k\_1000 342

opm 141

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_2.sm case j12041\_2.sm

8 127.9971296787262 s [138, 190] -2.127659574468085 [0, 0, 0, 3, 3, 11, 19, 3, 10, 18, 19, 9, 20, 26, 5, 15, 37, 3, 34, 5, 9, 18, 25, 21, 34, 15, 25, 5, 26, 34, 28, 11, 39, 48, 39, 28, 35, 18, 52, 46, 48, 22, 52, 21, 34, 14, 39, 26, 51, 57, 11, 55, 48, 57, 31, 46, 26, 57, 25, 34, 80, 61, 43, 97, 61, 73, 9, 22, 49, 21, 62, 45, 45, 63, 61, 28, 68, 72, 71, 62, 68, 80, 89, 58, 72, 89, 99, 68, 73, 80, 73, 30, 51, 88, 78, 95, 105, 80, 69, 88, 86, 69, 44, 80, 82, 105, 113, 82, 92, 113, 80, 116, 120, 113, 123, 107, 121, 130, 113, 105, 137, 138] 0

k\_1000 343

opm 141

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_3.sm case j12041\_3.sm

37 728.4978494644165 s [147, 183] 4.25531914893617 [0, 8, 0, 0, 8, 8, 22, 10, 13, 14, 34, 49, 13, 13, 22, 62, 13, 31, 22, 8, 19, 27, 14, 18, 19, 20, 24, 22, 31, 34, 70, 55, 29, 38, 24, 27, 24, 34, 14, 19, 43, 44, 44, 55, 60, 69, 51, 31, 27, 60, 34, 63, 55, 41, 37, 76, 41, 41, 80, 43, 69, 51, 84, 28, 51, 46, 76, 69, 75, 91, 60, 68, 79, 68, 70, 77, 84, 75, 84, 84, 95, 34, 84, 76, 75, 97, 79, 95, 81, 97, 97, 82, 86, 35, 101, 107, 94, 101, 97, 85, 101, 107, 84, 74, 107, 107, 105, 101, 102, 113, 110, 118, 116, 127, 87, 122, 108, 132, 126, 141, 132, 147] 0

k\_1000 344

opm 116

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_4.sm case j12041\_4.sm

38 712.3974528312683 s [123, 148] 6.0344827586206895 [0, 0, 0, 5, 15, 15, 6, 4, 8, 6, 4, 5, 23, 23, 4, 30, 10, 31, 7, 20, 17, 38, 20, 19, 25, 6, 20, 11, 15, 23, 10, 32, 8, 32, 44, 62, 32, 36, 11, 34, 11, 32, 25, 86, 39, 39, 44, 14, 33, 10, 26, 25, 39, 50, 35, 39, 69, 25, 51, 30, 35, 42, 45, 51, 52, 50, 33, 34, 51, 31, 56, 57, 60, 45, 62, 70, 51, 52, 50, 76, 69, 52, 32, 42, 56, 46, 70, 83, 63, 76, 64, 63, 68, 83, 76, 82, 91, 83, 74, 50, 86, 69, 82, 96, 61, 70, 83, 77, 95, 85, 105, 88, 95, 99, 109, 113, 102, 86, 112, 86, 119, 123] 0

k\_1000 345

opm 138

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_5.sm case j12041\_5.sm

31 718.5979714393616 s [145, 148] 5.072463768115942 [0, 0, 0, 0, 3, 13, 22, 22, 32, 3, 3, 32, 13, 37, 66, 32, 37, 37, 5, 22, 46, 16, 46, 34, 44, 47, 44, 34, 77, 34, 39, 27, 47, 15, 50, 66, 27, 80, 37, 54, 39, 63, 44, 73, 15, 5, 59, 22, 80, 47, 37, 42, 88, 54, 58, 59, 55, 76, 44, 63, 43, 69, 55, 48, 47, 73, 54, 77, 64, 75, 57, 95, 63, 80, 64, 58, 86, 85, 75, 66, 78, 86, 66, 93, 90, 98, 73, 73, 106, 66, 84, 93, 68, 78, 83, 101, 90, 92, 86, 100, 99, 100, 95, 94, 93, 122, 105, 88, 116, 99, 111, 109, 116, 124, 129, 140, 131, 124, 117, 141, 131, 145] 0

k\_1000 346

opm 113

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_6.sm case j12041\_6.sm

49 721.3956344127655 s [122, 149] 7.964601769911504 [0, 0, 0, 0, 6, 9, 1, 22, 1, 11, 14, 15, 26, 15, 16, 11, 9, 6, 16, 16, 27, 11, 28, 24, 23, 17, 32, 38, 25, 24, 41, 41, 41, 22, 24, 70, 50, 32, 41, 32, 23, 36, 18, 44, 41, 49, 57, 52, 41, 41, 41, 16, 28, 47, 47, 49, 48, 52, 65, 6, 29, 69, 50, 50, 62, 55, 69, 61, 62, 55, 60, 73, 66, 79, 43, 60, 60, 50, 49, 51, 65, 78, 61, 81, 87, 71, 85, 66, 71, 89, 74, 71, 71, 71, 71, 87, 78, 84, 98, 96, 78, 57, 86, 96, 85, 87, 95, 104, 105, 88, 109, 99, 111, 93, 112, 99, 109, 98, 120, 111, 112, 122] 0

k\_1000 347

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_7.sm case j12041\_7.sm

43 709.0437803268433 s [118, 131] 8.256880733944955 [0, 0, 0, 0, 1, 5, 1, 10, 11, 18, 18, 13, 31, 22, 32, 10, 23, 40, 19, 10, 24, 45, 19, 29, 25, 19, 39, 20, 31, 41, 1, 24, 41, 18, 24, 29, 19, 32, 29, 41, 23, 29, 9, 36, 49, 49, 29, 38, 49, 22, 48, 52, 60, 64, 38, 34, 41, 50, 53, 34, 59, 59, 39, 20, 52, 39, 50, 70, 63, 50, 60, 62, 60, 64, 64, 46, 58, 54, 60, 52, 70, 68, 62, 53, 50, 77, 79, 55, 68, 72, 84, 57, 86, 73, 79, 71, 84, 64, 79, 83, 70, 65, 80, 98, 70, 89, 85, 86, 83, 96, 94, 64, 91, 98, 106, 99, 68, 105, 109, 107, 107, 118] 0

k\_1000 348

opm 138

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_8.sm case j12041\_8.sm

38 721.2227301597595 s [148, 220] 7.246376811594203 [0, 0, 0, 0, 3, 8, 8, 7, 9, 16, 13, 8, 28, 16, 26, 33, 16, 26, 3, 39, 23, 26, 3, 30, 49, 34, 23, 37, 15, 11, 30, 13, 42, 34, 39, 47, 39, 11, 70, 9, 20, 40, 46, 80, 28, 24, 48, 33, 30, 49, 48, 24, 23, 47, 56, 76, 90, 33, 43, 53, 90, 56, 47, 64, 98, 59, 74, 49, 30, 90, 96, 98, 86, 46, 98, 107, 100, 57, 49, 106, 57, 64, 100, 62, 106, 61, 104, 110, 117, 70, 74, 80, 115, 82, 77, 111, 76, 90, 116, 96, 97, 126, 114, 114, 77, 82, 122, 123, 123, 110, 133, 127, 117, 123, 130, 140, 145, 140, 147, 142, 96, 148] 0

k\_1000 349

opm 121

the random choice case path in j120 ./rcpsp/j120.sm/j12041\_9.sm case j12041\_9.sm

15 179.82925701141357 s [119, 283] -1.6528925619834711 [0, 0, 0, 0, 5, 13, 3, 3, 20, 13, 5, 16, 23, 3, 5, 6, 17, 5, 17, 28, 7, 26, 35, 26, 11, 3, 5, 39, 39, 39, 28, 46, 12, 6, 11, 5, 51, 19, 45, 47, 21, 51, 48, 36, 11, 64, 34, 37, 21, 21, 10, 35, 20, 25, 54, 29, 54, 31, 34, 69, 68, 43, 61, 48, 55, 65, 16, 64, 55, 71, 46, 42, 35, 31, 26, 75, 65, 83, 60, 48, 78, 71, 68, 59, 52, 39, 70, 54, 52, 83, 53, 74, 56, 81, 75, 78, 80, 89, 90, 84, 64, 97, 97, 85, 92, 83, 96, 90, 102, 73, 80, 110, 85, 101, 90, 78, 102, 96, 113, 106, 108, 119] 0

k\_1000 350

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_1.sm case j12042\_1.sm

37 728.4062077999115 s [124, 134] 14.814814814814813 [0, 0, 0, 8, 8, 4, 15, 11, 18, 8, 29, 22, 8, 30, 38, 29, 11, 11, 4, 33, 18, 8, 54, 15, 46, 25, 11, 15, 19, 28, 33, 41, 9, 38, 29, 11, 38, 47, 22, 58, 11, 36, 24, 63, 21, 55, 24, 36, 38, 57, 38, 65, 57, 44, 46, 44, 44, 46, 67, 35, 60, 29, 41, 77, 55, 28, 44, 38, 73, 84, 41, 88, 49, 53, 89, 91, 97, 84, 60, 67, 42, 84, 31, 97, 75, 72, 46, 84, 97, 44, 106, 106, 53, 67, 53, 79, 63, 72, 54, 77, 82, 110, 68, 85, 92, 88, 100, 114, 92, 96, 106, 89, 110, 96, 106, 95, 106, 120, 112, 121, 114, 124] 0

k\_1000 351

opm 118

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_10.sm case j12042\_10.sm

13 612.1479570865631 s [129, 167] 9.322033898305085 [0, 0, 0, 29, 10, 18, 10, 18, 10, 21, 29, 18, 29, 35, 13, 39, 21, 21, 28, 38, 18, 43, 16, 20, 20, 18, 18, 25, 29, 39, 14, 26, 22, 31, 38, 43, 35, 39, 41, 28, 53, 4, 60, 4, 43, 39, 7, 39, 52, 13, 46, 29, 29, 32, 40, 47, 35, 46, 46, 23, 52, 60, 60, 43, 46, 52, 62, 61, 69, 57, 54, 68, 57, 26, 49, 67, 47, 45, 67, 65, 69, 76, 69, 70, 74, 87, 69, 65, 79, 84, 99, 64, 77, 79, 78, 86, 96, 90, 60, 80, 76, 79, 89, 95, 105, 99, 109, 112, 112, 90, 70, 83, 96, 87, 113, 104, 113, 96, 106, 120, 118, 129] 0

k\_1000 352

opm 126

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_2.sm case j12042\_2.sm

22 715.443609714508 s [136, 306] 7.936507936507936 [0, 0, 0, 0, 10, 14, 14, 10, 14, 14, 5, 20, 14, 14, 18, 17, 27, 26, 27, 20, 32, 26, 36, 36, 8, 34, 36, 5, 14, 20, 9, 20, 32, 32, 45, 36, 18, 37, 50, 45, 39, 47, 17, 26, 44, 41, 48, 36, 36, 36, 52, 44, 55, 46, 58, 9, 9, 23, 56, 26, 27, 55, 44, 57, 65, 51, 39, 74, 62, 54, 64, 74, 57, 84, 88, 84, 48, 47, 74, 76, 55, 65, 65, 67, 93, 61, 67, 84, 88, 57, 91, 73, 96, 91, 101, 104, 71, 76, 76, 84, 81, 94, 100, 84, 76, 98, 83, 103, 103, 111, 104, 91, 111, 94, 117, 108, 110, 104, 127, 119, 116, 136] 0

k\_1000 353

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_3.sm case j12042\_3.sm

26 219.73757195472717 s [106, 305] 0.0 [0, 0, 0, 0, 4, 6, 5, 6, 6, 6, 6, 12, 16, 24, 4, 16, 21, 5, 18, 7, 17, 7, 6, 19, 35, 28, 20, 15, 24, 12, 6, 21, 23, 11, 21, 50, 32, 17, 23, 18, 43, 11, 41, 21, 15, 15, 25, 28, 30, 33, 28, 35, 35, 33, 51, 33, 30, 38, 16, 38, 30, 62, 48, 57, 40, 32, 57, 62, 37, 25, 43, 41, 45, 23, 49, 57, 37, 43, 62, 64, 50, 46, 40, 48, 48, 57, 50, 64, 48, 50, 62, 67, 57, 68, 74, 59, 62, 51, 71, 62, 51, 71, 73, 56, 81, 57, 78, 58, 71, 81, 71, 76, 73, 82, 79, 88, 78, 88, 93, 84, 96, 106] 0

k\_1000 354

opm 104

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_4.sm case j12042\_4.sm

48 722.9099862575531 s [115, 204] 10.576923076923077 [0, 3, 0, 0, 3, 5, 8, 12, 13, 17, 8, 3, 9, 19, 17, 13, 21, 16, 6, 12, 13, 12, 13, 31, 33, 38, 3, 19, 31, 50, 29, 32, 32, 31, 19, 15, 24, 26, 21, 8, 37, 28, 36, 63, 47, 48, 9, 23, 56, 47, 50, 29, 90, 32, 27, 32, 50, 11, 28, 42, 38, 29, 56, 66, 73, 40, 48, 42, 44, 54, 63, 72, 67, 72, 54, 62, 55, 68, 63, 60, 76, 29, 36, 44, 76, 55, 76, 84, 86, 86, 86, 86, 72, 90, 66, 82, 42, 90, 66, 96, 90, 84, 75, 67, 97, 95, 99, 95, 99, 67, 95, 108, 75, 102, 70, 106, 105, 67, 100, 100, 111, 115] 0

k\_1000 355

opm 120

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_5.sm case j12042\_5.sm

37 729.3714125156403 s [127, 151] 5.833333333333333 [0, 0, 0, 0, 4, 12, 22, 4, 14, 12, 15, 4, 25, 4, 14, 32, 17, 11, 11, 22, 7, 7, 22, 21, 15, 20, 20, 33, 42, 17, 58, 30, 21, 10, 61, 40, 22, 47, 54, 56, 29, 28, 37, 14, 65, 61, 51, 15, 62, 56, 40, 37, 55, 43, 64, 42, 26, 41, 12, 65, 33, 48, 42, 62, 51, 82, 49, 70, 58, 51, 19, 70, 72, 75, 82, 76, 61, 71, 70, 82, 71, 90, 80, 81, 98, 75, 72, 71, 73, 86, 80, 72, 83, 104, 51, 84, 93, 107, 86, 94, 104, 71, 86, 93, 91, 108, 110, 94, 98, 111, 104, 98, 110, 111, 115, 104, 110, 107, 124, 120, 113, 127] 0

k\_1000 356

opm 119

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_6.sm case j12042\_6.sm

46 723.1919193267822 s [127, 227] 6.722689075630252 [0, 0, 0, 0, 10, 11, 25, 19, 5, 10, 15, 15, 24, 34, 5, 5, 34, 37, 24, 28, 28, 34, 6, 37, 43, 31, 31, 47, 53, 38, 54, 37, 25, 11, 61, 40, 57, 50, 27, 40, 58, 43, 44, 31, 63, 47, 57, 17, 64, 38, 57, 50, 10, 65, 35, 65, 62, 75, 65, 57, 43, 67, 44, 43, 31, 40, 42, 62, 66, 75, 65, 61, 64, 71, 62, 65, 67, 63, 70, 70, 79, 83, 84, 71, 62, 58, 64, 84, 96, 83, 64, 76, 82, 84, 79, 70, 92, 84, 84, 96, 90, 96, 86, 87, 92, 94, 98, 103, 93, 102, 102, 83, 92, 96, 93, 96, 106, 115, 121, 115, 101, 127] 0

k\_1000 357

opm 123

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_7.sm case j12042\_7.sm

60 718.4571723937988 s [130, 293] 5.691056910569105 [0, 0, 0, 0, 6, 2, 15, 21, 25, 5, 32, 6, 13, 3, 31, 25, 2, 21, 27, 21, 6, 27, 13, 21, 34, 38, 34, 33, 34, 42, 37, 36, 29, 3, 38, 27, 15, 44, 48, 49, 49, 45, 21, 46, 40, 31, 49, 37, 59, 27, 49, 15, 29, 53, 38, 49, 40, 68, 15, 67, 48, 58, 32, 67, 44, 53, 77, 49, 55, 67, 53, 67, 59, 77, 50, 58, 49, 52, 57, 69, 71, 67, 67, 68, 52, 73, 82, 89, 79, 69, 80, 94, 82, 70, 74, 50, 74, 82, 71, 94, 79, 79, 84, 86, 94, 101, 89, 88, 86, 54, 97, 97, 105, 103, 103, 103, 109, 111, 121, 110, 94, 130] 0

k\_1000 358

opm 113

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_8.sm case j12042\_8.sm

38 715.2716002464294 s [122, 226] 7.964601769911504 [0, 0, 0, 0, 13, 2, 12, 8, 12, 12, 23, 43, 11, 23, 10, 18, 11, 2, 23, 13, 53, 21, 21, 24, 26, 8, 20, 24, 11, 22, 38, 23, 32, 32, 28, 38, 26, 21, 28, 30, 33, 41, 40, 44, 33, 35, 33, 54, 23, 61, 54, 46, 32, 41, 54, 55, 40, 33, 64, 55, 41, 48, 46, 53, 54, 61, 42, 64, 63, 63, 69, 73, 73, 42, 71, 59, 73, 74, 55, 64, 62, 72, 72, 61, 82, 83, 83, 64, 81, 63, 78, 77, 84, 86, 82, 86, 87, 87, 93, 77, 91, 73, 92, 84, 83, 92, 71, 88, 114, 93, 101, 89, 101, 105, 103, 101, 105, 106, 103, 119, 115, 122] 0

k\_1000 359

opm 104

the random choice case path in j120 ./rcpsp/j120.sm/j12042\_9.sm case j12042\_9.sm

80 723.4366633892059 s [108, 261] 3.8461538461538463 [0, 0, 0, 0, 3, 10, 10, 18, 6, 18, 7, 5, 3, 10, 6, 12, 3, 5, 8, 7, 14, 18, 20, 11, 22, 8, 8, 12, 38, 31, 6, 17, 11, 22, 19, 23, 23, 26, 36, 31, 15, 26, 14, 26, 38, 14, 30, 25, 31, 24, 46, 38, 48, 38, 38, 36, 35, 50, 36, 35, 21, 55, 35, 56, 45, 44, 55, 39, 46, 38, 36, 23, 52, 55, 39, 52, 55, 48, 52, 44, 48, 58, 58, 59, 53, 63, 70, 63, 60, 71, 80, 85, 65, 50, 60, 67, 69, 67, 71, 78, 68, 70, 86, 62, 68, 78, 85, 75, 78, 88, 78, 75, 88, 86, 94, 102, 78, 84, 107, 97, 94, 108] 0

k\_1000 360

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_1.sm case j12043\_1.sm

16 162.42152190208435 s [105, 134] 0.0 [0, 0, 0, 0, 6, 13, 5, 13, 13, 15, 20, 15, 23, 26, 7, 15, 22, 17, 17, 10, 5, 5, 16, 36, 23, 24, 44, 22, 23, 17, 26, 18, 14, 7, 18, 6, 22, 20, 17, 29, 37, 17, 7, 26, 24, 33, 53, 31, 17, 33, 14, 53, 37, 36, 14, 44, 37, 24, 28, 45, 26, 57, 37, 68, 36, 30, 35, 31, 43, 34, 43, 21, 36, 48, 60, 48, 37, 60, 69, 24, 54, 65, 77, 69, 85, 69, 85, 57, 45, 44, 54, 52, 68, 72, 68, 55, 57, 72, 63, 69, 77, 79, 90, 83, 72, 66, 75, 74, 52, 83, 66, 79, 79, 83, 90, 96, 85, 99, 89, 98, 104, 105] 0

k\_1000 361

opm 113

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_10.sm case j12043\_10.sm

15 215.92785930633545 s [111, 121] -1.7699115044247788 [0, 0, 0, 0, 1, 3, 1, 10, 4, 10, 10, 18, 10, 5, 18, 25, 5, 30, 25, 12, 27, 14, 30, 1, 22, 6, 5, 18, 30, 6, 30, 25, 18, 11, 13, 42, 33, 12, 5, 39, 22, 45, 30, 5, 47, 37, 47, 22, 22, 30, 12, 36, 37, 42, 33, 37, 28, 15, 31, 40, 48, 37, 33, 45, 40, 45, 33, 50, 48, 57, 61, 76, 57, 65, 51, 59, 47, 46, 57, 67, 22, 63, 50, 63, 63, 57, 57, 73, 70, 67, 73, 68, 49, 39, 74, 75, 73, 84, 75, 85, 84, 47, 90, 85, 49, 97, 93, 50, 80, 53, 101, 85, 67, 101, 87, 75, 102, 106, 97, 107, 106, 111] 0

k\_1000 362

opm 120

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_2.sm case j12043\_2.sm

37 736.7662756443024 s [122, 145] 1.6666666666666667 [0, 0, 0, 0, 6, 9, 7, 6, 10, 7, 7, 19, 10, 7, 13, 13, 8, 19, 12, 29, 20, 36, 12, 19, 13, 17, 12, 20, 21, 13, 13, 28, 33, 29, 21, 18, 8, 29, 15, 36, 21, 38, 18, 39, 37, 43, 14, 47, 25, 36, 30, 33, 16, 46, 40, 41, 39, 30, 53, 47, 36, 29, 35, 62, 60, 53, 66, 72, 48, 28, 46, 53, 57, 60, 53, 45, 53, 78, 74, 49, 72, 46, 33, 53, 63, 62, 70, 80, 80, 82, 87, 81, 72, 87, 70, 93, 65, 55, 66, 93, 93, 53, 63, 72, 81, 87, 58, 91, 77, 101, 77, 82, 67, 91, 102, 111, 100, 99, 113, 101, 108, 122] 0

k\_1000 363

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_3.sm case j12043\_3.sm

33 718.831059217453 s [98, 120] 3.1578947368421053 [0, 0, 0, 0, 5, 26, 9, 8, 5, 13, 11, 20, 13, 15, 9, 15, 22, 19, 5, 14, 22, 22, 16, 10, 10, 14, 15, 2, 20, 24, 26, 20, 34, 30, 25, 25, 37, 6, 20, 16, 24, 42, 42, 28, 45, 32, 11, 14, 14, 31, 31, 34, 15, 53, 34, 50, 23, 42, 51, 31, 48, 31, 71, 42, 38, 42, 22, 8, 36, 48, 51, 47, 50, 48, 59, 43, 49, 56, 51, 37, 43, 56, 58, 32, 63, 46, 36, 66, 49, 44, 76, 64, 66, 58, 43, 66, 54, 64, 57, 76, 66, 66, 66, 66, 66, 70, 75, 57, 80, 74, 78, 82, 75, 75, 83, 79, 87, 77, 85, 87, 94, 98] 0

k\_1000 364

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_4.sm case j12043\_4.sm

55 722.6218147277832 s [108, 201] 2.857142857142857 [0, 0, 0, 0, 4, 4, 4, 8, 14, 14, 14, 17, 14, 25, 36, 36, 8, 17, 13, 23, 13, 17, 22, 22, 14, 19, 22, 21, 21, 31, 22, 23, 42, 33, 29, 29, 13, 22, 29, 27, 28, 29, 32, 42, 31, 14, 36, 52, 42, 77, 37, 25, 39, 30, 36, 21, 46, 39, 45, 54, 46, 45, 46, 59, 41, 47, 59, 52, 47, 38, 55, 33, 64, 26, 52, 70, 68, 29, 67, 54, 49, 68, 41, 42, 46, 49, 72, 72, 56, 55, 67, 59, 85, 69, 49, 58, 56, 69, 39, 64, 80, 92, 66, 59, 70, 97, 65, 70, 67, 77, 74, 72, 80, 88, 80, 87, 97, 92, 97, 103, 100, 108] 0

k\_1000 365

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_5.sm case j12043\_5.sm

34 733.6877889633179 s [111, 266] 5.714285714285714 [0, 0, 0, 0, 5, 6, 17, 4, 12, 9, 9, 16, 12, 41, 16, 19, 42, 49, 17, 29, 19, 5, 49, 56, 8, 19, 32, 29, 57, 16, 19, 25, 29, 49, 19, 57, 51, 58, 37, 24, 32, 25, 32, 29, 24, 42, 32, 33, 45, 65, 28, 38, 56, 40, 44, 36, 45, 47, 8, 17, 52, 45, 52, 61, 23, 55, 65, 57, 58, 42, 56, 65, 56, 58, 67, 48, 74, 51, 64, 67, 65, 86, 36, 69, 44, 73, 77, 66, 56, 63, 59, 66, 89, 84, 69, 72, 67, 78, 67, 66, 77, 78, 81, 44, 80, 80, 70, 84, 67, 74, 67, 87, 71, 89, 90, 94, 96, 93, 101, 103, 72, 111] 0

k\_1000 366

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_6.sm case j12043\_6.sm

25 699.3792963027954 s [107, 113] 9.183673469387756 [0, 0, 0, 0, 4, 4, 7, 6, 8, 5, 12, 16, 5, 14, 14, 14, 23, 14, 4, 19, 13, 8, 19, 9, 23, 8, 20, 16, 17, 20, 7, 22, 25, 29, 12, 23, 17, 26, 22, 39, 32, 12, 34, 26, 49, 17, 37, 57, 27, 23, 43, 30, 27, 65, 65, 40, 45, 25, 24, 39, 36, 34, 27, 45, 48, 45, 73, 26, 46, 25, 46, 49, 65, 43, 51, 51, 27, 46, 81, 55, 53, 69, 58, 53, 34, 46, 69, 60, 70, 64, 61, 40, 65, 69, 40, 47, 51, 50, 70, 65, 70, 61, 55, 81, 73, 78, 73, 96, 70, 71, 75, 81, 81, 79, 89, 85, 83, 96, 103, 89, 100, 107] 0

k\_1000 367

opm 122

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_7.sm case j12043\_7.sm

44 700.4828879833221 s [127, 207] 4.098360655737705 [0, 0, 0, 0, 2, 2, 2, 3, 3, 13, 11, 4, 22, 16, 7, 23, 4, 7, 13, 6, 14, 3, 13, 19, 23, 15, 14, 16, 23, 13, 23, 32, 31, 22, 14, 14, 15, 15, 13, 23, 15, 21, 22, 32, 13, 23, 39, 38, 32, 32, 29, 27, 32, 35, 20, 25, 45, 47, 38, 32, 57, 29, 23, 46, 12, 32, 39, 35, 40, 40, 37, 57, 45, 53, 45, 56, 46, 47, 55, 55, 48, 47, 56, 62, 46, 63, 66, 66, 39, 73, 61, 73, 53, 56, 63, 61, 71, 61, 82, 72, 66, 69, 76, 61, 84, 76, 76, 82, 90, 68, 68, 73, 70, 85, 78, 103, 93, 113, 120, 86, 81, 127] 0

k\_1000 368

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_8.sm case j12043\_8.sm

18 543.3592798709869 s [115, 152] 0.0 [0, 0, 0, 0, 5, 5, 7, 14, 9, 21, 14, 28, 5, 6, 5, 6, 10, 9, 18, 16, 20, 10, 27, 32, 7, 33, 9, 14, 32, 52, 24, 21, 29, 7, 20, 60, 13, 18, 27, 36, 14, 32, 22, 52, 33, 27, 33, 19, 29, 29, 43, 22, 24, 42, 71, 10, 25, 20, 33, 43, 43, 16, 52, 45, 57, 33, 22, 5, 62, 43, 48, 53, 52, 20, 43, 46, 56, 60, 33, 62, 68, 36, 62, 43, 29, 63, 62, 70, 43, 56, 62, 67, 52, 77, 78, 62, 65, 68, 56, 67, 42, 83, 75, 62, 71, 78, 75, 62, 78, 65, 79, 79, 87, 97, 88, 80, 98, 105, 78, 107, 79, 115] 0

k\_1000 369

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12043\_9.sm case j12043\_9.sm

14 672.2602064609528 s [109, 122] 3.8095238095238098 [0, 0, 0, 0, 6, 4, 9, 9, 6, 15, 15, 19, 15, 17, 27, 2, 18, 17, 9, 18, 15, 15, 25, 25, 15, 19, 23, 25, 18, 25, 25, 32, 28, 26, 28, 31, 23, 35, 35, 28, 15, 18, 6, 25, 33, 42, 24, 40, 9, 48, 35, 40, 40, 44, 32, 48, 48, 33, 31, 49, 33, 48, 2, 57, 36, 9, 37, 53, 57, 68, 58, 41, 28, 52, 40, 52, 64, 58, 63, 43, 78, 55, 59, 45, 56, 59, 67, 55, 59, 68, 78, 68, 57, 71, 80, 76, 68, 43, 85, 63, 76, 82, 81, 68, 81, 69, 76, 84, 66, 78, 86, 74, 91, 92, 85, 92, 88, 98, 96, 101, 89, 109] 0

k\_1000 370

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_1.sm case j12044\_1.sm

18 412.7181603908539 s [100, 104] 0.0 [0, 4, 0, 0, 4, 14, 2, 2, 5, 5, 4, 18, 2, 14, 19, 10, 6, 19, 15, 10, 6, 11, 14, 8, 27, 10, 25, 14, 20, 31, 18, 12, 32, 8, 33, 12, 34, 4, 8, 13, 43, 16, 7, 25, 25, 13, 33, 20, 32, 27, 42, 18, 21, 27, 14, 33, 31, 42, 20, 25, 46, 40, 26, 53, 42, 48, 25, 48, 34, 47, 28, 47, 29, 49, 58, 57, 60, 46, 25, 42, 62, 41, 46, 34, 49, 62, 61, 48, 46, 54, 57, 61, 66, 64, 59, 59, 67, 57, 67, 57, 40, 75, 54, 77, 62, 72, 48, 67, 84, 64, 42, 72, 77, 64, 46, 68, 81, 88, 98, 70, 87, 100] 0

k\_1000 371

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_10.sm case j12044\_10.sm

21 717.8849580287933 s [108, 157] 10.204081632653061 [0, 0, 0, 0, 4, 6, 4, 6, 15, 9, 15, 22, 7, 12, 12, 6, 7, 11, 12, 19, 7, 12, 4, 12, 19, 12, 27, 21, 12, 18, 25, 19, 22, 21, 32, 51, 29, 29, 37, 18, 27, 46, 12, 37, 15, 43, 48, 46, 50, 7, 27, 31, 42, 22, 42, 37, 34, 24, 39, 49, 23, 27, 29, 19, 29, 37, 46, 50, 34, 50, 53, 44, 47, 52, 36, 37, 42, 47, 58, 47, 44, 43, 50, 31, 58, 43, 53, 58, 62, 58, 69, 62, 62, 67, 72, 46, 65, 55, 65, 69, 65, 69, 71, 65, 75, 79, 78, 62, 71, 71, 74, 71, 86, 69, 80, 88, 93, 83, 82, 89, 98, 108] 0

k\_1000 372

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_2.sm case j12044\_2.sm

12 365.74710416793823 s [111, 119] -0.8928571428571428 [0, 0, 0, 0, 7, 7, 7, 7, 12, 5, 14, 9, 16, 19, 9, 17, 17, 20, 13, 7, 9, 30, 20, 13, 6, 9, 16, 13, 33, 42, 28, 7, 6, 26, 30, 20, 23, 19, 20, 40, 10, 51, 22, 30, 30, 22, 23, 33, 32, 16, 40, 26, 26, 40, 37, 19, 33, 33, 20, 58, 39, 44, 37, 47, 46, 39, 42, 46, 53, 48, 48, 49, 49, 30, 55, 53, 58, 43, 44, 52, 52, 44, 54, 53, 56, 54, 53, 67, 44, 65, 49, 58, 70, 63, 63, 24, 64, 81, 54, 56, 65, 58, 63, 85, 72, 55, 67, 70, 93, 67, 68, 72, 85, 72, 80, 95, 97, 94, 68, 80, 103, 111] 0

k\_1000 373

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_3.sm case j12044\_3.sm

6 125.21497654914856 s [107, 120] 0.0 [0, 0, 0, 0, 2, 2, 6, 2, 4, 10, 9, 7, 4, 9, 9, 6, 17, 9, 25, 13, 17, 6, 7, 24, 22, 32, 12, 15, 22, 37, 15, 13, 12, 32, 20, 18, 25, 29, 33, 19, 18, 20, 14, 26, 24, 29, 42, 38, 33, 22, 32, 42, 42, 46, 30, 30, 42, 49, 39, 52, 43, 20, 52, 33, 24, 33, 36, 59, 33, 47, 25, 56, 30, 58, 36, 58, 43, 35, 30, 52, 35, 43, 58, 36, 24, 59, 43, 30, 34, 47, 42, 49, 65, 43, 68, 49, 43, 52, 47, 50, 52, 52, 66, 62, 71, 62, 75, 66, 78, 76, 76, 83, 85, 64, 73, 84, 84, 92, 98, 85, 94, 107] 0

k\_1000 374

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_4.sm case j12044\_4.sm

26 718.415257692337 s [99, 148] 4.2105263157894735 [0, 0, 0, 0, 1, 4, 4, 1, 6, 4, 2, 9, 4, 5, 2, 11, 13, 1, 11, 19, 4, 9, 20, 9, 14, 4, 19, 6, 19, 4, 13, 19, 23, 4, 28, 28, 8, 20, 28, 19, 37, 20, 20, 5, 28, 33, 13, 21, 24, 6, 12, 11, 19, 36, 25, 23, 14, 2, 37, 41, 28, 38, 38, 29, 45, 28, 31, 44, 20, 36, 28, 33, 45, 36, 28, 45, 38, 51, 45, 60, 25, 54, 60, 62, 45, 43, 51, 45, 43, 52, 30, 54, 51, 45, 52, 65, 58, 66, 63, 52, 62, 63, 60, 70, 69, 38, 72, 66, 70, 55, 63, 79, 71, 72, 80, 80, 89, 53, 86, 94, 61, 99] 0

k\_1000 375

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_5.sm case j12044\_5.sm

20 139.6060950756073 s [98, 267] 0.0 [0, 0, 0, 0, 3, 11, 11, 3, 3, 5, 11, 9, 9, 5, 12, 7, 17, 20, 3, 12, 13, 9, 11, 19, 14, 18, 3, 24, 24, 20, 20, 18, 32, 24, 27, 14, 24, 29, 15, 27, 31, 34, 31, 36, 18, 43, 18, 43, 15, 19, 33, 25, 30, 52, 26, 31, 31, 32, 24, 11, 33, 9, 29, 16, 33, 43, 43, 53, 39, 33, 39, 25, 49, 20, 36, 56, 43, 60, 24, 41, 52, 52, 26, 46, 50, 49, 55, 64, 45, 71, 53, 63, 63, 72, 53, 64, 36, 55, 62, 45, 73, 58, 63, 41, 66, 53, 71, 76, 82, 73, 80, 80, 76, 82, 73, 75, 85, 82, 89, 88, 86, 98] 0

k\_1000 376

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_6.sm case j12044\_6.sm

10 40.34220790863037 s [106, 233] 0.0 [0, 0, 0, 0, 9, 2, 9, 9, 9, 9, 12, 9, 10, 19, 14, 15, 13, 37, 24, 12, 14, 22, 20, 22, 26, 14, 36, 26, 14, 15, 13, 11, 36, 4, 41, 33, 36, 11, 14, 33, 33, 24, 14, 24, 39, 24, 17, 26, 32, 32, 46, 36, 26, 36, 38, 24, 26, 41, 49, 41, 36, 36, 33, 46, 37, 54, 40, 37, 44, 46, 52, 33, 43, 59, 34, 54, 49, 52, 62, 38, 59, 53, 51, 46, 54, 53, 57, 52, 50, 64, 61, 54, 38, 61, 67, 64, 65, 58, 57, 69, 73, 68, 65, 64, 70, 73, 72, 60, 80, 74, 80, 77, 86, 94, 86, 86, 77, 96, 104, 103, 96, 106] 0

k\_1000 377

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_7.sm case j12044\_7.sm

9 55.696683406829834 s [98, 98] 0.0 [0, 0, 0, 0, 1, 3, 10, 10, 11, 1, 17, 18, 27, 1, 3, 7, 14, 11, 10, 17, 3, 14, 10, 18, 16, 18, 12, 37, 22, 25, 15, 40, 21, 22, 10, 16, 37, 32, 21, 14, 10, 27, 35, 19, 37, 22, 14, 27, 42, 30, 27, 29, 44, 27, 7, 45, 36, 41, 19, 16, 37, 42, 54, 46, 51, 27, 37, 54, 51, 32, 37, 57, 55, 63, 32, 55, 34, 66, 41, 45, 45, 51, 63, 57, 41, 29, 54, 54, 38, 58, 52, 57, 37, 51, 54, 54, 64, 61, 64, 61, 72, 66, 74, 64, 66, 66, 70, 64, 76, 51, 63, 76, 80, 84, 81, 72, 91, 75, 95, 84, 81, 98] 0

k\_1000 378

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_8.sm case j12044\_8.sm

81 714.9048562049866 s [109, 114] 0.9259259259259258 [0, 0, 0, 0, 10, 2, 2, 6, 13, 13, 10, 17, 13, 12, 20, 20, 24, 26, 12, 17, 25, 27, 22, 29, 41, 20, 42, 29, 32, 27, 36, 33, 27, 42, 39, 38, 38, 34, 5, 19, 2, 40, 42, 52, 29, 51, 32, 6, 46, 41, 46, 29, 40, 49, 41, 26, 52, 27, 42, 52, 54, 57, 52, 38, 43, 46, 6, 42, 55, 59, 49, 43, 46, 52, 49, 52, 61, 66, 74, 43, 43, 48, 54, 59, 54, 29, 38, 51, 49, 39, 56, 64, 52, 46, 56, 66, 62, 58, 70, 63, 62, 61, 68, 66, 74, 66, 64, 72, 64, 79, 81, 71, 81, 87, 97, 80, 79, 87, 67, 104, 91, 109] 0

k\_1000 379

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12044\_9.sm case j12044\_9.sm

1 18.202478647232056 s [91, 183] 0.0 [0, 0, 0, 0, 3, 5, 7, 19, 11, 5, 5, 7, 11, 15, 6, 12, 15, 7, 27, 12, 18, 16, 12, 18, 12, 27, 15, 31, 19, 10, 26, 7, 13, 26, 35, 28, 31, 25, 34, 18, 23, 37, 28, 41, 34, 25, 25, 38, 45, 27, 29, 37, 28, 34, 42, 26, 45, 41, 35, 43, 33, 43, 45, 55, 45, 38, 28, 48, 37, 42, 42, 45, 38, 59, 34, 46, 47, 45, 48, 40, 48, 54, 63, 50, 58, 51, 49, 61, 38, 58, 58, 51, 32, 61, 66, 63, 69, 63, 67, 73, 71, 71, 74, 77, 54, 63, 75, 65, 69, 56, 74, 65, 75, 80, 77, 82, 59, 84, 80, 89, 87, 91] 0

k\_1000 380

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_1.sm case j12045\_1.sm

0 7.874808311462402 s [108, 188] 0.0 [0, 0, 0, 15, 3, 9, 9, 4, 4, 3, 12, 21, 9, 12, 13, 28, 5, 27, 3, 12, 29, 19, 9, 27, 38, 5, 12, 29, 4, 25, 13, 20, 29, 38, 19, 19, 30, 29, 17, 14, 43, 20, 37, 44, 14, 28, 29, 21, 21, 48, 32, 29, 30, 51, 31, 33, 43, 52, 25, 42, 37, 15, 54, 54, 52, 52, 36, 33, 12, 20, 34, 63, 37, 42, 33, 48, 58, 63, 54, 55, 54, 61, 43, 67, 25, 67, 52, 65, 72, 61, 50, 72, 77, 69, 75, 61, 84, 67, 60, 58, 63, 78, 71, 31, 69, 77, 91, 91, 74, 61, 77, 69, 94, 94, 70, 78, 94, 91, 94, 101, 104, 108] 0

k\_1000 381

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_10.sm case j12045\_10.sm

6 39.10864496231079 s [99, 99] 0.0 [0, 0, 0, 0, 7, 9, 18, 7, 21, 8, 25, 9, 7, 6, 14, 10, 22, 8, 9, 7, 23, 32, 18, 32, 21, 9, 32, 23, 16, 28, 22, 34, 22, 29, 25, 38, 41, 22, 7, 47, 19, 14, 14, 29, 29, 38, 29, 8, 29, 39, 19, 33, 51, 29, 23, 22, 10, 10, 29, 47, 34, 37, 58, 24, 45, 40, 33, 38, 45, 47, 40, 37, 51, 47, 41, 58, 26, 37, 54, 44, 54, 47, 55, 51, 39, 56, 47, 65, 47, 52, 62, 66, 57, 40, 51, 56, 58, 63, 51, 65, 64, 55, 65, 66, 68, 72, 81, 64, 74, 74, 81, 56, 70, 77, 90, 79, 76, 65, 87, 98, 90, 99] 0

k\_1000 382

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_2.sm case j12045\_2.sm

62 383.4852068424225 s [91, 122] 0.0 [0, 0, 0, 0, 3, 2, 3, 10, 7, 13, 6, 13, 16, 6, 6, 6, 2, 9, 2, 17, 7, 16, 18, 21, 13, 16, 7, 13, 7, 10, 25, 22, 9, 18, 15, 18, 18, 25, 6, 9, 25, 24, 7, 21, 32, 30, 25, 32, 32, 29, 30, 38, 34, 24, 39, 51, 41, 35, 18, 45, 48, 22, 29, 21, 45, 3, 48, 24, 31, 6, 41, 38, 41, 32, 21, 67, 45, 51, 49, 36, 54, 45, 41, 52, 57, 40, 57, 32, 43, 58, 60, 57, 48, 46, 61, 51, 56, 69, 58, 41, 48, 61, 65, 60, 67, 77, 69, 72, 77, 61, 56, 74, 74, 68, 66, 84, 78, 82, 90, 71, 71, 91] 0

k\_1000 383

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_3.sm case j12045\_3.sm

34 125.16703462600708 s [98, 172] 0.0 [0, 0, 0, 0, 4, 4, 4, 4, 5, 10, 16, 10, 5, 6, 5, 13, 7, 17, 10, 13, 7, 14, 13, 7, 10, 14, 19, 7, 4, 20, 17, 7, 10, 21, 12, 26, 23, 25, 19, 30, 10, 25, 19, 33, 26, 17, 25, 31, 28, 19, 6, 19, 22, 21, 21, 23, 23, 28, 32, 33, 28, 38, 27, 33, 25, 37, 36, 27, 36, 39, 26, 27, 35, 32, 46, 39, 32, 43, 32, 36, 46, 37, 38, 39, 43, 28, 51, 44, 44, 46, 53, 36, 53, 50, 42, 53, 58, 51, 33, 53, 40, 55, 42, 44, 60, 52, 55, 61, 60, 65, 61, 58, 70, 71, 81, 66, 71, 89, 93, 73, 25, 98] 0

k\_1000 384

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_4.sm case j12045\_4.sm

13 49.76305651664734 s [103, 105] 0.0 [0, 0, 0, 0, 3, 4, 3, 6, 12, 4, 10, 3, 8, 10, 12, 8, 12, 16, 16, 16, 4, 21, 21, 23, 9, 12, 21, 22, 29, 16, 3, 10, 16, 13, 26, 13, 27, 24, 16, 13, 31, 31, 23, 24, 32, 29, 17, 16, 31, 24, 36, 29, 46, 31, 28, 30, 34, 31, 32, 32, 36, 50, 53, 39, 34, 43, 52, 36, 47, 46, 61, 38, 46, 46, 47, 45, 53, 49, 50, 51, 39, 46, 59, 54, 47, 45, 49, 59, 54, 58, 46, 59, 59, 58, 64, 54, 59, 67, 62, 66, 65, 67, 70, 61, 67, 70, 69, 45, 65, 80, 80, 73, 64, 83, 84, 83, 92, 77, 70, 101, 69, 103] 0

k\_1000 385

opm 116

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_5.sm case j12045\_5.sm

10 41.534053325653076 s [115, 147] -0.8620689655172413 [0, 0, 0, 0, 4, 11, 20, 23, 23, 29, 29, 4, 36, 29, 27, 4, 4, 36, 6, 46, 36, 38, 23, 4, 45, 36, 28, 7, 12, 37, 6, 36, 20, 34, 17, 17, 39, 46, 17, 44, 49, 46, 28, 38, 7, 45, 53, 56, 56, 11, 39, 53, 11, 12, 53, 7, 45, 11, 55, 28, 37, 33, 60, 55, 63, 62, 56, 46, 56, 60, 68, 76, 33, 65, 30, 46, 55, 65, 74, 82, 74, 68, 64, 55, 66, 59, 27, 76, 37, 75, 75, 60, 55, 59, 59, 71, 82, 73, 84, 83, 86, 86, 83, 62, 84, 93, 55, 92, 102, 82, 91, 83, 91, 93, 102, 82, 102, 106, 105, 105, 110, 115] 0

k\_1000 386

opm 125

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_6.sm case j12045\_6.sm

2 10.351377487182617 s [125, 199] 0.0 [0, 0, 0, 0, 10, 7, 12, 3, 22, 12, 10, 31, 13, 13, 18, 7, 22, 31, 18, 21, 28, 31, 13, 18, 16, 28, 31, 38, 24, 34, 32, 49, 42, 34, 38, 10, 21, 45, 39, 29, 40, 10, 21, 27, 42, 42, 29, 49, 37, 24, 38, 35, 34, 43, 51, 34, 46, 58, 46, 55, 52, 55, 49, 57, 63, 67, 63, 58, 57, 10, 59, 67, 67, 34, 76, 46, 58, 61, 71, 67, 49, 74, 54, 66, 45, 82, 63, 57, 55, 67, 80, 76, 90, 75, 71, 86, 86, 90, 92, 45, 80, 90, 77, 78, 57, 90, 101, 51, 77, 100, 96, 95, 86, 106, 114, 87, 103, 108, 117, 115, 100, 125] 0

k\_1000 387

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_7.sm case j12045\_7.sm

6 21.394209623336792 s [103, 123] 0.0 [0, 1, 0, 0, 1, 1, 4, 5, 5, 15, 1, 11, 11, 14, 4, 17, 25, 17, 14, 17, 21, 11, 27, 21, 20, 4, 14, 26, 13, 15, 24, 33, 27, 15, 22, 33, 28, 33, 20, 41, 27, 15, 33, 25, 41, 15, 15, 33, 39, 48, 31, 33, 25, 33, 21, 33, 39, 54, 27, 20, 39, 40, 43, 42, 54, 31, 46, 43, 42, 47, 27, 42, 49, 32, 47, 23, 40, 49, 42, 38, 52, 48, 58, 46, 55, 52, 53, 56, 68, 62, 68, 44, 44, 77, 53, 62, 68, 76, 68, 52, 77, 72, 70, 83, 79, 79, 76, 78, 83, 81, 60, 90, 85, 80, 83, 83, 85, 86, 93, 95, 85, 103] 0

k\_1000 388

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_8.sm case j12045\_8.sm

15 62.78975534439087 s [103, 109] 0.0 [0, 0, 0, 0, 10, 3, 10, 3, 10, 15, 18, 15, 3, 15, 18, 15, 13, 18, 20, 22, 22, 20, 24, 19, 25, 23, 30, 27, 20, 28, 28, 35, 15, 38, 42, 15, 25, 28, 25, 22, 25, 18, 25, 36, 27, 35, 27, 27, 26, 42, 6, 33, 33, 42, 51, 43, 38, 51, 48, 54, 45, 36, 48, 52, 35, 42, 33, 61, 52, 47, 62, 40, 42, 52, 42, 56, 62, 68, 53, 22, 39, 42, 56, 47, 61, 54, 64, 55, 64, 42, 56, 64, 64, 73, 79, 67, 73, 56, 51, 80, 56, 64, 64, 72, 71, 73, 82, 57, 71, 89, 75, 53, 81, 79, 71, 88, 64, 73, 96, 93, 83, 103] 0

k\_1000 389

opm 114

the random choice case path in j120 ./rcpsp/j120.sm/j12045\_9.sm case j12045\_9.sm

0 2.351922035217285 s [114, 115] 0.0 [0, 0, 0, 0, 3, 1, 3, 3, 7, 4, 13, 21, 8, 21, 16, 16, 4, 17, 15, 11, 13, 21, 31, 26, 11, 1, 17, 15, 25, 18, 25, 27, 3, 30, 31, 16, 16, 35, 16, 35, 15, 11, 18, 21, 12, 27, 22, 37, 27, 28, 12, 39, 27, 25, 31, 34, 43, 34, 45, 34, 45, 45, 29, 39, 26, 18, 48, 25, 49, 54, 53, 36, 43, 57, 62, 40, 39, 40, 40, 41, 57, 37, 42, 44, 37, 49, 55, 47, 52, 37, 49, 55, 61, 61, 61, 56, 69, 64, 61, 64, 74, 49, 52, 58, 40, 67, 76, 60, 66, 67, 52, 65, 79, 74, 86, 89, 89, 96, 81, 106, 49, 114] 0

k\_1000 390

opm 188

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_1.sm case j12046\_1.sm

13 738.6849634647369 s [235, 343] 25.0 [0, 0, 0, 0, 20, 7, 27, 28, 7, 11, 27, 32, 18, 27, 43, 35, 18, 59, 10, 59, 27, 68, 34, 19, 20, 47, 33, 50, 68, 10, 43, 89, 32, 36, 48, 69, 54, 72, 20, 53, 57, 98, 69, 85, 101, 50, 77, 11, 41, 41, 80, 50, 110, 159, 57, 68, 77, 101, 111, 89, 69, 119, 135, 135, 89, 36, 48, 128, 118, 118, 129, 149, 182, 33, 97, 119, 142, 128, 119, 143, 59, 141, 80, 143, 145, 89, 144, 150, 165, 141, 141, 162, 150, 149, 172, 111, 80, 158, 119, 114, 145, 191, 172, 204, 165, 162, 182, 164, 196, 193, 200, 204, 210, 191, 210, 210, 218, 200, 159, 225, 215, 235] 0

k\_1000 391

opm 188

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_10.sm case j12046\_10.sm

15 764.7523486614227 s [223, 284] 18.617021276595743 [0, 0, 16, 0, 22, 8, 4, 21, 13, 8, 29, 8, 17, 22, 34, 13, 36, 27, 35, 42, 27, 27, 51, 64, 42, 46, 12, 45, 48, 89, 106, 54, 74, 29, 45, 45, 98, 99, 102, 64, 75, 83, 57, 74, 104, 69, 83, 48, 120, 60, 104, 103, 34, 74, 120, 84, 103, 83, 74, 98, 120, 79, 83, 130, 74, 133, 127, 130, 130, 139, 87, 92, 139, 45, 130, 158, 83, 92, 143, 112, 140, 161, 175, 133, 97, 139, 150, 149, 110, 169, 112, 143, 146, 152, 163, 154, 164, 152, 138, 152, 161, 156, 161, 189, 167, 177, 175, 167, 197, 167, 199, 213, 181, 208, 213, 167, 104, 181, 197, 214, 222, 223] 0

k\_1000 392

opm 198

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_2.sm case j12046\_2.sm

13 788.6107721328735 s [239, 484] 20.707070707070706 [0, 0, 0, 18, 25, 25, 58, 9, 28, 32, 41, 9, 48, 66, 10, 9, 90, 28, 56, 15, 74, 66, 78, 70, 90, 48, 48, 22, 66, 66, 99, 73, 79, 78, 66, 94, 122, 69, 69, 85, 109, 32, 109, 70, 102, 100, 15, 109, 100, 79, 101, 141, 28, 94, 113, 100, 90, 115, 109, 125, 70, 101, 87, 150, 123, 131, 15, 109, 122, 131, 122, 130, 115, 150, 134, 150, 141, 95, 150, 169, 160, 174, 154, 141, 158, 132, 178, 169, 185, 141, 185, 186, 102, 198, 157, 162, 185, 194, 206, 213, 215, 162, 189, 163, 213, 206, 166, 213, 185, 194, 213, 178, 217, 215, 224, 224, 227, 227, 230, 236, 230, 239] 0

k\_1000 393

opm 175

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_3.sm case j12046\_3.sm

14 678.7912955284119 s [207, 286] 18.285714285714285 [0, 0, 0, 0, 2, 8, 8, 12, 16, 15, 12, 22, 8, 42, 23, 19, 22, 11, 23, 11, 14, 22, 2, 20, 27, 53, 34, 22, 34, 38, 56, 50, 22, 3, 47, 34, 47, 38, 28, 40, 53, 56, 16, 30, 64, 42, 70, 42, 34, 64, 84, 30, 84, 56, 79, 69, 77, 94, 91, 70, 94, 76, 15, 100, 37, 101, 56, 125, 108, 127, 135, 135, 100, 118, 135, 144, 118, 139, 139, 148, 148, 119, 117, 119, 125, 94, 151, 140, 141, 158, 166, 184, 148, 94, 167, 167, 158, 109, 187, 141, 69, 151, 151, 167, 157, 156, 172, 191, 184, 167, 174, 171, 188, 191, 187, 198, 190, 201, 202, 201, 198, 207] 0

k\_1000 394

opm 170

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_4.sm case j12046\_4.sm

19 728.6184158325195 s [191, 336] 12.352941176470589 [0, 0, 0, 0, 26, 24, 52, 26, 76, 32, 42, 7, 51, 32, 48, 60, 67, 40, 49, 6, 16, 39, 7, 79, 16, 16, 42, 24, 30, 52, 44, 51, 30, 32, 67, 43, 56, 51, 82, 48, 76, 67, 71, 87, 8, 75, 75, 82, 91, 6, 39, 82, 71, 87, 26, 100, 84, 108, 108, 96, 65, 111, 121, 108, 130, 96, 98, 97, 61, 87, 129, 116, 97, 119, 108, 102, 119, 148, 135, 130, 150, 138, 60, 138, 120, 111, 138, 132, 132, 139, 144, 135, 108, 91, 140, 144, 143, 145, 158, 149, 164, 164, 165, 149, 139, 151, 167, 144, 152, 172, 174, 180, 167, 178, 150, 144, 172, 180, 183, 188, 183, 191] 0

k\_1000 395

opm 149

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_5.sm case j12046\_5.sm

18 727.1580030918121 s [175, 188] 17.449664429530202 [0, 0, 0, 12, 1, 4, 4, 5, 19, 1, 11, 19, 27, 22, 30, 24, 3, 22, 5, 30, 28, 33, 40, 45, 33, 30, 39, 25, 57, 42, 28, 47, 12, 68, 39, 28, 52, 46, 19, 12, 12, 44, 77, 106, 46, 43, 60, 69, 10, 52, 77, 36, 39, 68, 21, 51, 63, 70, 117, 55, 58, 94, 68, 58, 44, 63, 82, 68, 78, 42, 87, 91, 87, 87, 97, 101, 60, 112, 87, 104, 77, 97, 101, 87, 106, 104, 101, 112, 109, 122, 106, 129, 92, 68, 107, 56, 120, 130, 122, 127, 127, 102, 145, 149, 137, 129, 147, 57, 138, 153, 120, 147, 154, 147, 149, 161, 159, 159, 166, 138, 159, 175] 0

k\_1000 396

opm 178

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_6.sm case j12046\_6.sm

15 604.8003394603729 s [185, 201] 3.932584269662921 [0, 0, 0, 0, 6, 7, 9, 13, 9, 42, 47, 47, 19, 13, 14, 52, 17, 14, 17, 14, 24, 37, 32, 24, 26, 52, 33, 42, 60, 52, 56, 34, 58, 55, 69, 73, 2, 84, 59, 69, 59, 94, 52, 80, 78, 95, 83, 60, 71, 51, 95, 73, 60, 106, 78, 71, 122, 115, 24, 105, 88, 106, 78, 107, 102, 129, 129, 115, 95, 81, 18, 107, 108, 79, 33, 84, 119, 129, 140, 95, 82, 115, 84, 119, 115, 122, 132, 133, 133, 94, 119, 141, 140, 146, 88, 137, 145, 120, 118, 121, 155, 118, 97, 110, 133, 149, 173, 146, 133, 145, 155, 159, 158, 158, 168, 180, 159, 162, 169, 180, 184, 185] 0

k\_1000 397

opm 170

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_7.sm case j12046\_7.sm

11 1440.8594007492065 s [199, 219] 17.058823529411764 [0, 0, 0, 0, 3, 12, 22, 32, 71, 15, 20, 37, 45, 46, 26, 5, 12, 36, 45, 46, 36, 19, 18, 39, 24, 12, 19, 36, 24, 54, 29, 46, 77, 59, 18, 16, 54, 84, 49, 84, 29, 51, 96, 46, 26, 59, 67, 59, 110, 36, 37, 37, 24, 28, 67, 67, 41, 71, 89, 64, 77, 33, 67, 90, 124, 89, 132, 77, 111, 80, 119, 19, 114, 59, 37, 110, 129, 42, 152, 132, 139, 84, 114, 137, 114, 151, 71, 155, 102, 123, 144, 147, 129, 160, 115, 158, 178, 130, 89, 119, 152, 102, 170, 159, 167, 168, 168, 115, 119, 168, 158, 186, 170, 178, 183, 188, 187, 173, 188, 196, 188, 199] 0

k\_1000 398

opm 176

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_8.sm case j12046\_8.sm

11 897.0825560092926 s [207, 216] 17.613636363636363 [0, 8, 0, 0, 9, 8, 13, 13, 8, 22, 12, 15, 22, 15, 30, 17, 28, 37, 15, 30, 2, 28, 37, 17, 24, 9, 53, 47, 34, 34, 19, 67, 54, 70, 41, 57, 28, 29, 17, 34, 71, 34, 41, 63, 81, 2, 45, 45, 61, 85, 81, 52, 69, 34, 90, 63, 38, 53, 69, 71, 48, 48, 71, 48, 61, 99, 81, 98, 67, 124, 99, 124, 108, 75, 132, 72, 109, 90, 89, 106, 112, 109, 138, 154, 102, 115, 163, 127, 109, 120, 115, 124, 139, 107, 124, 94, 75, 150, 94, 136, 144, 159, 144, 132, 173, 182, 182, 173, 136, 139, 162, 166, 136, 169, 184, 188, 189, 150, 173, 199, 198, 207] 0

k\_1000 399

opm 166

the random choice case path in j120 ./rcpsp/j120.sm/j12046\_9.sm case j12046\_9.sm

11 1001.4849987030029 s [208, 220] 25.301204819277107 [0, 0, 0, 23, 1, 2, 4, 24, 16, 1, 13, 6, 33, 33, 6, 6, 12, 42, 13, 18, 12, 34, 59, 64, 42, 50, 16, 50, 50, 57, 37, 52, 42, 74, 47, 93, 62, 67, 23, 63, 74, 26, 106, 109, 24, 26, 37, 12, 81, 62, 57, 93, 74, 83, 33, 71, 67, 80, 77, 77, 71, 81, 50, 24, 81, 93, 84, 98, 109, 109, 97, 64, 98, 124, 105, 118, 112, 161, 133, 133, 116, 116, 111, 130, 143, 142, 80, 124, 106, 124, 142, 171, 159, 168, 143, 52, 171, 150, 178, 150, 165, 161, 176, 194, 171, 184, 180, 185, 180, 173, 159, 153, 168, 176, 187, 185, 199, 197, 190, 204, 197, 208] 0

k\_1000 400

opm 137

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_1.sm case j12047\_1.sm

24 733.8220314979553 s [158, 362] 15.328467153284672 [0, 0, 0, 54, 3, 1, 4, 1, 11, 6, 9, 14, 15, 6, 69, 11, 14, 17, 23, 24, 17, 24, 14, 40, 43, 15, 30, 32, 32, 32, 3, 34, 23, 8, 16, 43, 50, 4, 35, 54, 79, 30, 27, 69, 65, 36, 32, 57, 36, 77, 50, 79, 53, 32, 53, 44, 32, 44, 57, 57, 83, 79, 79, 63, 81, 63, 73, 65, 81, 95, 95, 40, 99, 87, 89, 82, 69, 91, 77, 95, 127, 57, 109, 36, 134, 94, 109, 62, 86, 102, 114, 97, 106, 118, 112, 114, 109, 122, 111, 140, 116, 119, 109, 110, 83, 110, 131, 127, 119, 128, 146, 134, 146, 97, 142, 142, 149, 135, 153, 151, 150, 158] 0

k\_1000 401

opm 132

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_10.sm case j12047\_10.sm

23 678.4993236064911 s [156, 188] 18.181818181818183 [0, 0, 0, 0, 1, 3, 7, 7, 15, 11, 1, 8, 12, 24, 32, 4, 4, 34, 23, 22, 44, 40, 31, 54, 5, 15, 31, 34, 16, 12, 40, 32, 6, 44, 49, 14, 5, 68, 12, 47, 32, 26, 42, 49, 44, 49, 3, 32, 23, 55, 40, 54, 68, 55, 47, 61, 52, 15, 54, 14, 60, 40, 53, 60, 23, 65, 69, 69, 65, 47, 79, 71, 69, 68, 55, 75, 57, 79, 67, 91, 78, 82, 99, 87, 97, 87, 104, 82, 104, 104, 113, 111, 117, 117, 106, 111, 91, 91, 122, 133, 117, 87, 126, 133, 127, 122, 136, 123, 123, 141, 129, 143, 120, 95, 133, 126, 136, 143, 147, 138, 151, 156] 0

k\_1000 402

opm 132

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_2.sm case j12047\_2.sm

31 738.8635537624359 s [147, 208] 11.363636363636363 [0, 0, 0, 7, 2, 2, 11, 2, 5, 17, 7, 17, 7, 26, 33, 33, 26, 19, 35, 13, 26, 7, 45, 34, 26, 7, 54, 44, 42, 35, 59, 46, 26, 39, 39, 31, 51, 44, 50, 45, 34, 23, 46, 34, 48, 11, 55, 63, 15, 46, 35, 58, 59, 26, 44, 44, 33, 43, 53, 65, 65, 63, 58, 75, 65, 69, 44, 76, 46, 99, 65, 88, 68, 72, 65, 71, 85, 74, 79, 72, 88, 69, 38, 69, 74, 93, 96, 75, 76, 84, 95, 62, 79, 75, 88, 80, 104, 79, 108, 94, 105, 110, 71, 96, 94, 107, 120, 93, 104, 106, 115, 117, 125, 128, 120, 110, 128, 130, 128, 128, 137, 147] 0

k\_1000 403

opm 125

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_3.sm case j12047\_3.sm

26 725.9221816062927 s [132, 201] 5.6000000000000005 [0, 0, 0, 0, 6, 6, 48, 9, 9, 86, 9, 12, 12, 12, 5, 19, 19, 16, 5, 12, 26, 45, 21, 20, 12, 26, 18, 26, 49, 20, 19, 48, 34, 30, 39, 26, 20, 49, 39, 48, 49, 43, 36, 59, 30, 28, 16, 60, 30, 58, 43, 25, 68, 66, 75, 81, 27, 62, 47, 34, 59, 38, 30, 66, 67, 66, 83, 70, 29, 84, 65, 86, 53, 77, 82, 60, 77, 84, 59, 83, 57, 92, 93, 75, 94, 90, 93, 98, 57, 97, 67, 100, 100, 105, 93, 100, 64, 59, 86, 100, 67, 109, 107, 93, 96, 90, 104, 96, 98, 113, 111, 111, 85, 107, 94, 113, 117, 117, 127, 123, 122, 132] 0

k\_1000 404

opm 132

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_4.sm case j12047\_4.sm

33 725.0050117969513 s [149, 188] 12.878787878787879 [0, 0, 0, 0, 7, 7, 19, 12, 12, 19, 10, 9, 28, 12, 24, 10, 32, 20, 33, 42, 26, 51, 1, 10, 22, 27, 26, 42, 39, 29, 1, 42, 58, 42, 56, 18, 54, 77, 52, 67, 66, 52, 13, 58, 54, 47, 27, 58, 26, 49, 49, 35, 57, 49, 4, 95, 37, 32, 53, 66, 49, 87, 87, 104, 111, 84, 37, 58, 87, 71, 68, 67, 92, 33, 78, 102, 93, 86, 93, 86, 102, 73, 102, 74, 73, 103, 107, 103, 95, 72, 89, 111, 103, 103, 110, 104, 120, 113, 87, 108, 112, 122, 111, 122, 123, 120, 126, 116, 126, 84, 130, 123, 120, 120, 99, 133, 139, 130, 131, 140, 141, 149] 0

k\_1000 405

opm 127

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_5.sm case j12047\_5.sm

18 710.6798274517059 s [149, 510] 17.322834645669293 [0, 0, 0, 0, 2, 27, 6, 7, 2, 2, 9, 34, 2, 7, 10, 7, 9, 17, 3, 4, 3, 9, 13, 4, 17, 18, 33, 17, 9, 9, 14, 24, 4, 20, 23, 23, 34, 69, 44, 9, 45, 10, 3, 15, 78, 53, 24, 42, 48, 71, 54, 44, 17, 48, 63, 15, 81, 63, 80, 53, 77, 69, 63, 84, 53, 44, 28, 53, 50, 92, 42, 92, 59, 63, 53, 84, 71, 84, 81, 93, 81, 93, 103, 88, 107, 97, 84, 80, 99, 95, 112, 103, 84, 112, 95, 99, 99, 69, 84, 122, 95, 109, 109, 71, 109, 114, 122, 106, 132, 125, 122, 117, 133, 132, 95, 132, 113, 135, 142, 131, 142, 149] 0

k\_1000 406

opm 137

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_6.sm case j12047\_6.sm

25 722.983540058136 s [150, 539] 9.48905109489051 [0, 0, 0, 4, 5, 10, 5, 83, 4, 25, 4, 10, 10, 15, 4, 10, 10, 7, 11, 19, 19, 50, 94, 20, 31, 20, 18, 20, 24, 30, 33, 29, 16, 59, 18, 26, 10, 10, 19, 59, 14, 59, 25, 33, 37, 61, 67, 43, 38, 64, 52, 94, 57, 43, 63, 57, 17, 63, 80, 102, 70, 63, 18, 32, 80, 43, 43, 65, 80, 59, 20, 64, 70, 67, 100, 76, 80, 112, 37, 90, 83, 87, 76, 43, 104, 104, 70, 66, 94, 57, 101, 102, 87, 91, 79, 79, 83, 122, 103, 80, 91, 102, 121, 105, 107, 122, 107, 116, 124, 115, 123, 107, 131, 116, 114, 122, 130, 139, 124, 131, 142, 150] 0

k\_1000 407

opm 118

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_7.sm case j12047\_7.sm

29 703.2130999565125 s [141, 216] 19.491525423728813 [0, 0, 0, 0, 8, 16, 8, 2, 8, 7, 16, 16, 7, 8, 13, 37, 18, 40, 8, 8, 20, 53, 47, 19, 52, 28, 14, 23, 30, 61, 30, 53, 13, 37, 22, 29, 11, 85, 55, 28, 31, 12, 80, 18, 40, 61, 47, 38, 69, 52, 53, 75, 20, 100, 62, 35, 43, 60, 68, 43, 69, 22, 70, 68, 40, 106, 85, 89, 69, 78, 77, 77, 96, 94, 96, 117, 72, 74, 80, 87, 90, 72, 97, 103, 84, 106, 122, 103, 100, 80, 106, 111, 111, 74, 108, 108, 85, 117, 111, 114, 90, 99, 119, 119, 111, 114, 119, 79, 123, 119, 122, 121, 114, 125, 121, 128, 122, 134, 132, 122, 140, 141] 0

k\_1000 408

opm 133

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_8.sm case j12047\_8.sm

15 830.8314008712769 s [164, 352] 23.308270676691727 [0, 0, 0, 0, 4, 7, 4, 28, 16, 4, 38, 19, 7, 19, 10, 26, 16, 17, 11, 19, 17, 10, 32, 7, 23, 27, 47, 47, 55, 24, 49, 57, 61, 64, 13, 47, 47, 55, 79, 57, 63, 64, 55, 47, 63, 69, 49, 16, 75, 73, 67, 87, 68, 99, 92, 96, 67, 80, 97, 21, 74, 79, 106, 61, 106, 75, 68, 87, 97, 115, 124, 85, 32, 102, 73, 69, 67, 95, 40, 131, 86, 99, 102, 69, 111, 106, 117, 116, 77, 85, 107, 134, 114, 125, 109, 104, 134, 138, 85, 114, 121, 146, 123, 124, 123, 139, 152, 139, 131, 152, 121, 107, 123, 139, 149, 151, 149, 138, 158, 155, 154, 164] 0

k\_1000 409

opm 144

the random choice case path in j120 ./rcpsp/j120.sm/j12047\_9.sm case j12047\_9.sm

15 725.551497220993 s [166, 216] 15.277777777777779 [0, 0, 0, 0, 8, 6, 6, 12, 17, 13, 9, 9, 20, 25, 8, 44, 9, 18, 23, 6, 35, 4, 25, 26, 26, 31, 35, 23, 25, 28, 17, 12, 43, 35, 23, 14, 44, 56, 52, 38, 52, 17, 32, 56, 59, 35, 43, 65, 29, 13, 64, 51, 43, 12, 61, 43, 73, 54, 96, 45, 62, 36, 52, 49, 71, 70, 70, 61, 39, 58, 66, 73, 77, 88, 77, 58, 66, 112, 29, 86, 75, 47, 75, 111, 80, 104, 88, 96, 73, 101, 96, 20, 80, 88, 91, 100, 91, 88, 99, 134, 77, 75, 117, 104, 117, 132, 113, 134, 143, 103, 122, 78, 143, 138, 152, 124, 132, 99, 152, 156, 152, 166] 0

k\_1000 410

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_1.sm case j12048\_1.sm

47 713.9266135692596 s [115, 136] 15.0 [0, 0, 0, 0, 1, 16, 1, 2, 7, 2, 7, 16, 12, 12, 8, 7, 10, 20, 8, 22, 29, 25, 7, 12, 12, 22, 20, 23, 25, 7, 30, 22, 16, 39, 46, 32, 37, 12, 22, 36, 33, 40, 24, 61, 29, 37, 46, 39, 43, 22, 32, 22, 49, 54, 20, 29, 48, 24, 30, 46, 41, 39, 38, 46, 39, 55, 54, 33, 48, 58, 68, 78, 49, 56, 71, 47, 82, 56, 55, 64, 82, 65, 76, 64, 50, 78, 64, 91, 85, 60, 43, 71, 61, 68, 64, 85, 76, 55, 78, 78, 85, 88, 89, 68, 71, 98, 96, 84, 78, 93, 102, 84, 93, 88, 105, 94, 93, 103, 112, 110, 103, 115] 0

k\_1000 411

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_10.sm case j12048\_10.sm

38 723.7242298126221 s [122, 185] 9.90990990990991 [0, 1, 0, 0, 10, 10, 15, 15, 15, 16, 1, 16, 19, 18, 8, 8, 9, 25, 15, 20, 35, 10, 1, 27, 13, 26, 10, 20, 20, 30, 33, 43, 35, 41, 25, 48, 27, 48, 10, 41, 41, 37, 27, 37, 27, 33, 18, 3, 16, 27, 51, 40, 24, 37, 19, 24, 69, 43, 41, 18, 52, 50, 50, 50, 62, 56, 53, 67, 55, 48, 60, 74, 61, 70, 63, 35, 72, 74, 65, 63, 81, 79, 65, 77, 72, 81, 59, 81, 84, 25, 85, 81, 101, 103, 112, 68, 73, 96, 87, 95, 88, 61, 110, 95, 66, 77, 101, 103, 68, 106, 101, 88, 84, 87, 81, 110, 117, 81, 116, 120, 106, 122] 0

k\_1000 412

opm 113

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_2.sm case j12048\_2.sm

28 693.329897403717 s [124, 128] 9.734513274336283 [0, 0, 0, 0, 7, 7, 16, 8, 16, 8, 3, 17, 25, 25, 3, 12, 8, 32, 15, 31, 25, 22, 33, 17, 12, 35, 17, 35, 25, 33, 41, 20, 45, 11, 32, 32, 43, 35, 45, 31, 38, 50, 25, 40, 53, 50, 45, 50, 59, 45, 54, 32, 59, 54, 60, 48, 61, 36, 65, 38, 53, 58, 45, 68, 63, 36, 66, 58, 64, 69, 68, 43, 74, 67, 81, 84, 76, 64, 72, 83, 74, 61, 78, 83, 68, 29, 84, 89, 84, 61, 83, 89, 87, 89, 89, 87, 81, 93, 97, 93, 102, 97, 108, 102, 58, 111, 111, 106, 95, 108, 112, 111, 116, 83, 117, 91, 106, 101, 115, 120, 123, 124] 0

k\_1000 413

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_3.sm case j12048\_3.sm

32 713.5531306266785 s [136, 156] 21.428571428571427 [0, 0, 0, 1, 5, 23, 5, 15, 21, 1, 9, 9, 20, 2, 20, 2, 15, 23, 23, 6, 30, 10, 30, 33, 14, 40, 26, 12, 23, 12, 83, 26, 16, 23, 38, 33, 38, 34, 35, 33, 38, 1, 46, 28, 47, 47, 10, 56, 63, 35, 69, 14, 102, 39, 46, 52, 43, 62, 55, 43, 56, 40, 74, 45, 10, 64, 56, 65, 55, 40, 86, 64, 74, 39, 41, 70, 101, 55, 49, 47, 43, 83, 69, 69, 91, 65, 77, 65, 70, 74, 69, 75, 78, 78, 88, 77, 86, 83, 89, 91, 99, 88, 92, 91, 96, 93, 108, 116, 101, 77, 110, 102, 116, 96, 95, 114, 120, 116, 126, 124, 126, 136] 0

k\_1000 414

opm 127

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_4.sm case j12048\_4.sm

31 699.3050906658173 s [139, 194] 9.448818897637794 [0, 0, 0, 0, 7, 5, 7, 29, 15, 7, 5, 44, 15, 25, 57, 19, 26, 25, 29, 19, 15, 25, 19, 36, 12, 25, 20, 46, 15, 46, 26, 26, 32, 67, 31, 59, 29, 32, 28, 20, 32, 57, 36, 54, 44, 39, 66, 82, 52, 67, 39, 72, 50, 29, 54, 59, 66, 81, 53, 26, 66, 49, 36, 50, 44, 76, 52, 59, 54, 75, 81, 76, 83, 76, 82, 115, 49, 67, 75, 66, 107, 81, 75, 81, 82, 83, 89, 72, 82, 94, 113, 79, 109, 82, 96, 90, 103, 124, 85, 118, 113, 87, 80, 89, 82, 97, 103, 124, 96, 109, 118, 115, 125, 119, 123, 128, 126, 129, 135, 129, 132, 139] 0

k\_1000 415

opm 110

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_5.sm case j12048\_5.sm

43 713.9098868370056 s [121, 151] 10.0 [0, 0, 0, 0, 10, 3, 12, 13, 13, 1, 19, 1, 13, 19, 21, 21, 13, 1, 12, 19, 10, 19, 15, 10, 15, 23, 22, 22, 29, 28, 31, 21, 32, 39, 28, 15, 31, 25, 19, 14, 25, 32, 39, 36, 24, 26, 21, 47, 34, 37, 32, 32, 12, 29, 38, 51, 38, 55, 43, 61, 46, 72, 38, 58, 74, 76, 55, 63, 70, 71, 92, 82, 24, 31, 43, 83, 92, 76, 47, 59, 63, 69, 52, 75, 93, 96, 74, 74, 51, 67, 47, 81, 63, 47, 69, 85, 84, 73, 92, 98, 52, 78, 59, 84, 92, 66, 101, 71, 93, 104, 85, 67, 102, 104, 104, 104, 111, 109, 116, 108, 105, 121] 0

k\_1000 416

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_6.sm case j12048\_6.sm

34 697.1331923007965 s [118, 131] 12.380952380952381 [0, 0, 0, 0, 2, 5, 7, 8, 17, 8, 17, 7, 5, 55, 7, 18, 36, 43, 2, 40, 18, 5, 17, 8, 26, 28, 49, 13, 3, 28, 18, 8, 18, 22, 28, 31, 11, 19, 36, 36, 30, 60, 27, 32, 16, 18, 36, 30, 49, 43, 22, 18, 32, 41, 82, 68, 46, 59, 46, 55, 26, 52, 54, 53, 28, 69, 65, 51, 32, 73, 38, 75, 50, 66, 73, 65, 22, 59, 52, 59, 38, 90, 68, 71, 40, 46, 65, 82, 56, 80, 80, 57, 80, 82, 83, 91, 60, 73, 83, 80, 89, 88, 101, 60, 89, 68, 92, 101, 100, 91, 108, 92, 100, 100, 107, 111, 103, 71, 115, 115, 113, 118] 0

k\_1000 417

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_7.sm case j12048\_7.sm

49 701.8248674869537 s [114, 271] 7.547169811320755 [0, 0, 0, 0, 5, 8, 5, 10, 10, 8, 19, 10, 20, 12, 20, 16, 21, 8, 21, 30, 48, 39, 13, 31, 32, 21, 25, 21, 35, 27, 38, 19, 8, 43, 8, 5, 27, 56, 25, 17, 24, 28, 18, 52, 35, 35, 49, 30, 28, 28, 49, 35, 59, 50, 48, 27, 46, 32, 46, 53, 62, 60, 56, 54, 68, 41, 62, 48, 65, 72, 29, 80, 80, 43, 70, 68, 43, 39, 59, 69, 46, 65, 53, 62, 59, 82, 75, 75, 90, 56, 61, 59, 81, 60, 61, 60, 81, 72, 75, 86, 68, 86, 75, 89, 74, 84, 90, 92, 96, 92, 82, 82, 96, 100, 101, 102, 98, 101, 104, 104, 109, 114] 0

k\_1000 418

opm 116

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_8.sm case j12048\_8.sm

40 724.2606837749481 s [127, 143] 9.482758620689655 [0, 0, 0, 0, 3, 2, 9, 10, 10, 15, 10, 20, 19, 6, 6, 13, 16, 19, 23, 19, 31, 26, 26, 16, 33, 28, 39, 36, 19, 23, 43, 36, 19, 53, 15, 37, 38, 15, 33, 26, 34, 36, 43, 54, 33, 42, 43, 58, 12, 58, 39, 63, 67, 63, 37, 17, 81, 65, 65, 69, 84, 49, 87, 49, 18, 39, 48, 56, 75, 58, 50, 91, 69, 42, 35, 91, 84, 76, 76, 92, 59, 81, 42, 88, 92, 50, 70, 80, 59, 98, 97, 84, 100, 100, 8, 60, 49, 92, 101, 95, 81, 108, 84, 79, 98, 92, 67, 92, 104, 111, 108, 111, 111, 109, 116, 108, 112, 120, 116, 113, 124, 127] 0

k\_1000 419

opm 113

the random choice case path in j120 ./rcpsp/j120.sm/j12048\_9.sm case j12048\_9.sm

53 722.7827188968658 s [123, 132] 8.849557522123893 [0, 0, 0, 0, 14, 7, 17, 7, 14, 22, 22, 19, 30, 5, 5, 24, 30, 37, 20, 42, 9, 33, 44, 52, 29, 14, 33, 33, 21, 47, 9, 24, 59, 17, 30, 37, 27, 33, 22, 14, 44, 47, 21, 44, 53, 59, 37, 42, 44, 52, 22, 7, 30, 55, 13, 47, 20, 56, 37, 56, 76, 54, 30, 65, 56, 84, 75, 52, 60, 73, 59, 82, 27, 92, 88, 61, 6, 82, 53, 76, 44, 56, 72, 76, 65, 56, 83, 72, 75, 76, 80, 94, 82, 68, 82, 66, 82, 80, 92, 103, 92, 85, 101, 103, 92, 99, 100, 106, 86, 105, 99, 87, 100, 79, 111, 115, 103, 110, 118, 118, 107, 123] 0

k\_1000 420

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_1.sm case j12049\_1.sm

70 723.4661281108856 s [101, 109] 5.208333333333334 [0, 0, 0, 0, 8, 7, 9, 7, 15, 9, 14, 8, 8, 14, 9, 9, 18, 18, 21, 16, 14, 18, 22, 24, 18, 21, 30, 32, 26, 15, 24, 19, 32, 28, 11, 39, 26, 27, 16, 12, 10, 23, 24, 36, 29, 40, 16, 27, 40, 33, 42, 23, 9, 30, 47, 49, 22, 16, 33, 33, 30, 36, 41, 22, 50, 48, 29, 31, 44, 41, 51, 21, 42, 48, 42, 75, 56, 39, 50, 51, 32, 48, 57, 56, 54, 28, 64, 68, 61, 50, 45, 47, 61, 67, 50, 48, 51, 51, 61, 77, 57, 69, 67, 70, 73, 64, 61, 70, 67, 79, 54, 83, 75, 78, 83, 72, 70, 78, 86, 92, 85, 101] 0

k\_1000 421

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_10.sm case j12049\_10.sm

61 709.2634041309357 s [106, 206] 9.278350515463918 [0, 0, 0, 0, 1, 8, 1, 5, 1, 8, 11, 8, 31, 17, 12, 17, 19, 14, 27, 19, 8, 14, 11, 3, 17, 17, 21, 12, 32, 20, 40, 27, 14, 21, 31, 31, 31, 39, 22, 44, 41, 40, 45, 33, 31, 44, 41, 40, 35, 21, 35, 49, 30, 22, 52, 37, 37, 49, 53, 44, 52, 66, 44, 53, 41, 63, 41, 50, 46, 44, 65, 42, 53, 53, 49, 50, 69, 53, 44, 60, 41, 65, 49, 72, 61, 60, 63, 44, 69, 63, 58, 72, 81, 72, 79, 68, 42, 69, 77, 79, 63, 77, 84, 58, 81, 69, 79, 89, 89, 59, 76, 95, 81, 96, 81, 81, 86, 92, 102, 96, 92, 106] 0

k\_1000 422

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_2.sm case j12049\_2.sm

49 725.2571761608124 s [119, 136] 9.174311926605505 [0, 0, 0, 0, 5, 7, 5, 5, 7, 9, 12, 11, 12, 15, 31, 19, 13, 41, 21, 36, 27, 30, 12, 30, 15, 26, 40, 13, 39, 25, 21, 19, 40, 11, 21, 47, 29, 25, 56, 64, 41, 34, 34, 70, 36, 48, 46, 50, 36, 46, 31, 50, 57, 57, 54, 50, 44, 67, 44, 54, 46, 59, 79, 48, 70, 34, 64, 48, 59, 64, 47, 70, 58, 75, 56, 54, 64, 79, 70, 84, 29, 57, 61, 75, 84, 92, 84, 59, 79, 79, 91, 94, 54, 70, 77, 57, 85, 77, 86, 81, 86, 79, 55, 97, 84, 86, 81, 96, 92, 74, 94, 109, 95, 105, 113, 107, 105, 97, 116, 102, 109, 119] 0

k\_1000 423

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_3.sm case j12049\_3.sm

46 720.5884006023407 s [104, 179] 8.333333333333332 [0, 0, 0, 0, 4, 4, 4, 10, 9, 20, 12, 12, 15, 4, 4, 9, 12, 9, 10, 24, 11, 14, 12, 77, 12, 24, 24, 14, 27, 24, 17, 30, 22, 21, 24, 41, 20, 26, 15, 30, 31, 17, 31, 32, 37, 84, 32, 45, 35, 27, 41, 39, 52, 45, 26, 26, 39, 41, 45, 50, 37, 45, 41, 26, 41, 46, 45, 50, 52, 52, 29, 37, 37, 49, 56, 61, 52, 59, 66, 60, 59, 49, 61, 60, 46, 70, 70, 76, 62, 52, 52, 76, 84, 58, 59, 66, 92, 74, 74, 77, 78, 74, 74, 59, 67, 81, 78, 81, 81, 74, 81, 84, 93, 87, 91, 84, 83, 93, 98, 81, 97, 104] 0

k\_1000 424

opm 96

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_4.sm case j12049\_4.sm

47 729.6652822494507 s [104, 128] 8.333333333333332 [0, 0, 0, 0, 3, 3, 8, 8, 28, 10, 19, 9, 21, 21, 24, 32, 7, 14, 9, 50, 20, 57, 34, 43, 51, 41, 9, 43, 29, 9, 21, 19, 21, 37, 29, 16, 11, 17, 35, 15, 14, 38, 24, 31, 44, 13, 19, 25, 30, 20, 14, 11, 19, 38, 29, 42, 49, 49, 40, 28, 68, 59, 30, 45, 72, 38, 31, 50, 51, 39, 49, 19, 25, 51, 34, 29, 59, 49, 58, 59, 59, 55, 34, 55, 60, 37, 57, 41, 64, 71, 68, 76, 75, 78, 84, 42, 64, 72, 64, 64, 54, 73, 87, 72, 65, 82, 68, 75, 84, 84, 84, 77, 29, 88, 88, 88, 80, 87, 98, 94, 96, 104] 0

k\_1000 425

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_5.sm case j12049\_5.sm

71 716.2214539051056 s [93, 143] 4.49438202247191 [0, 0, 0, 0, 3, 9, 1, 8, 14, 1, 9, 10, 3, 14, 7, 3, 3, 9, 5, 19, 4, 15, 1, 15, 16, 21, 16, 3, 8, 20, 19, 11, 21, 15, 4, 18, 26, 26, 17, 25, 24, 28, 37, 26, 35, 25, 41, 37, 44, 21, 42, 33, 25, 33, 52, 14, 36, 28, 37, 44, 34, 49, 23, 36, 49, 32, 20, 50, 52, 41, 38, 41, 42, 52, 43, 55, 50, 44, 44, 44, 52, 50, 56, 41, 52, 59, 47, 49, 59, 52, 58, 36, 50, 61, 63, 63, 66, 63, 68, 55, 77, 56, 77, 78, 57, 55, 77, 62, 65, 68, 83, 67, 67, 65, 84, 72, 77, 49, 82, 92, 82, 93] 0

k\_1000 426

opm 128

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_6.sm case j12049\_6.sm

15 172.35105752944946 s [128, 142] 0.0 [0, 0, 0, 0, 6, 5, 6, 12, 8, 20, 12, 12, 30, 9, 4, 5, 32, 22, 28, 28, 22, 29, 18, 29, 39, 6, 15, 15, 41, 43, 29, 8, 22, 42, 41, 54, 20, 11, 33, 43, 36, 59, 26, 45, 50, 33, 41, 51, 51, 51, 29, 51, 88, 64, 32, 13, 64, 59, 70, 13, 41, 9, 66, 59, 50, 68, 66, 74, 43, 71, 73, 80, 51, 73, 43, 51, 43, 59, 66, 73, 30, 69, 68, 79, 75, 66, 66, 83, 83, 90, 80, 84, 83, 99, 46, 90, 75, 76, 78, 85, 97, 85, 84, 95, 104, 94, 98, 88, 97, 99, 61, 106, 107, 99, 106, 116, 116, 91, 109, 125, 101, 128] 0

k\_1000 427

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_7.sm case j12049\_7.sm

64 708.3418393135071 s [110, 164] 11.11111111111111 [0, 0, 0, 0, 8, 4, 4, 8, 12, 14, 4, 4, 12, 13, 21, 8, 16, 13, 13, 28, 23, 13, 8, 31, 32, 23, 34, 32, 36, 26, 14, 26, 23, 21, 40, 32, 31, 19, 32, 37, 35, 19, 36, 41, 48, 6, 28, 25, 45, 37, 17, 35, 32, 56, 30, 46, 38, 54, 44, 44, 36, 46, 51, 61, 12, 40, 44, 49, 61, 38, 34, 52, 63, 86, 55, 41, 54, 68, 56, 65, 65, 54, 62, 68, 94, 72, 104, 72, 46, 56, 61, 72, 72, 80, 72, 86, 75, 67, 94, 86, 61, 96, 83, 88, 82, 65, 72, 78, 82, 96, 93, 88, 98, 95, 96, 100, 103, 103, 107, 102, 105, 110] 0

k\_1000 428

opm 113

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_8.sm case j12049\_8.sm

66 720.6746056079865 s [126, 129] 11.504424778761061 [0, 0, 0, 0, 1, 1, 8, 1, 7, 10, 6, 21, 8, 6, 19, 10, 12, 8, 23, 25, 23, 13, 40, 37, 31, 18, 40, 18, 7, 31, 28, 18, 37, 24, 37, 10, 47, 18, 45, 28, 18, 28, 37, 56, 13, 28, 55, 44, 61, 60, 27, 37, 38, 21, 46, 48, 71, 53, 54, 61, 28, 49, 46, 38, 60, 40, 68, 73, 54, 64, 80, 26, 69, 70, 70, 61, 44, 74, 81, 68, 81, 85, 46, 79, 80, 61, 81, 56, 65, 77, 75, 92, 71, 85, 75, 86, 83, 89, 87, 87, 97, 92, 86, 97, 83, 95, 84, 87, 98, 97, 75, 113, 104, 93, 112, 106, 116, 95, 99, 94, 124, 126] 0

k\_1000 429

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j12049\_9.sm case j12049\_9.sm

36 716.3615174293518 s [104, 135] 7.216494845360824 [0, 0, 0, 0, 3, 8, 8, 6, 4, 8, 10, 16, 16, 10, 18, 11, 19, 19, 16, 10, 11, 18, 16, 22, 6, 6, 25, 31, 27, 4, 18, 56, 20, 26, 26, 36, 35, 39, 71, 32, 33, 26, 46, 16, 17, 39, 30, 42, 51, 49, 25, 10, 44, 26, 30, 47, 31, 50, 56, 49, 19, 62, 39, 26, 33, 43, 27, 56, 44, 49, 35, 47, 62, 39, 57, 54, 53, 79, 52, 44, 57, 71, 71, 33, 32, 61, 60, 75, 38, 53, 62, 60, 42, 72, 68, 71, 65, 69, 61, 72, 74, 73, 79, 81, 73, 75, 77, 77, 88, 92, 81, 86, 81, 96, 83, 87, 81, 88, 97, 100, 96, 104] 0

k\_1000 430

opm 74

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_1.sm case j1204\_1.sm

29 238.13915753364563 s [74, 76] 0.0 [0, 0, 0, 0, 8, 14, 8, 10, 17, 40, 8, 8, 17, 9, 16, 10, 10, 9, 14, 10, 17, 8, 14, 17, 19, 5, 17, 26, 26, 26, 14, 8, 17, 27, 28, 18, 17, 23, 17, 17, 17, 27, 5, 24, 23, 8, 17, 24, 14, 29, 17, 21, 27, 33, 28, 27, 17, 19, 14, 27, 36, 21, 30, 36, 19, 30, 17, 30, 39, 35, 36, 36, 41, 39, 41, 50, 10, 34, 23, 44, 37, 30, 24, 33, 17, 30, 42, 47, 44, 50, 37, 34, 39, 47, 54, 33, 44, 35, 39, 41, 50, 59, 46, 53, 50, 36, 50, 53, 56, 58, 51, 69, 59, 56, 59, 58, 47, 63, 64, 63, 73, 74] 0

k\_1000 431

opm 77

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_10.sm case j1204\_10.sm

6 30.597325801849365 s [77, 93] 0.0 [0, 0, 0, 0, 5, 8, 22, 5, 17, 13, 5, 9, 13, 9, 10, 22, 11, 8, 17, 9, 9, 12, 22, 11, 17, 13, 9, 30, 15, 20, 14, 11, 21, 12, 27, 18, 16, 30, 14, 22, 16, 15, 12, 10, 17, 23, 24, 23, 34, 13, 13, 35, 17, 28, 32, 16, 21, 17, 25, 23, 9, 30, 18, 22, 12, 34, 32, 16, 9, 31, 27, 44, 16, 33, 10, 41, 31, 30, 27, 20, 22, 18, 25, 44, 27, 31, 19, 35, 36, 41, 36, 33, 41, 49, 41, 24, 39, 50, 42, 34, 36, 42, 39, 46, 45, 50, 36, 46, 57, 50, 53, 57, 64, 48, 40, 44, 62, 52, 49, 74, 58, 77] 0

k\_1000 432

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_2.sm case j1204\_2.sm

8 49.27785849571228 s [107, 126] 0.0 [0, 0, 0, 0, 8, 8, 8, 14, 14, 18, 2, 18, 14, 10, 27, 27, 16, 27, 16, 21, 23, 15, 19, 26, 23, 32, 16, 35, 7, 15, 26, 45, 9, 14, 27, 24, 7, 23, 32, 37, 22, 23, 37, 46, 37, 10, 32, 43, 23, 49, 51, 53, 30, 55, 37, 34, 35, 55, 37, 55, 39, 30, 30, 14, 40, 49, 19, 65, 18, 35, 57, 39, 24, 70, 32, 65, 56, 70, 37, 52, 49, 48, 59, 48, 36, 54, 65, 74, 77, 59, 40, 68, 70, 51, 43, 76, 52, 55, 60, 67, 57, 72, 78, 70, 60, 76, 68, 77, 86, 78, 96, 78, 83, 98, 88, 88, 56, 65, 106, 92, 89, 107] 0

k\_1000 433

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_3.sm case j1204\_3.sm

18 148.95030212402344 s [95, 170] 0.0 [0, 0, 0, 0, 4, 4, 14, 12, 18, 24, 19, 5, 5, 25, 14, 12, 22, 4, 9, 30, 18, 30, 22, 9, 37, 10, 10, 38, 14, 30, 7, 23, 36, 19, 5, 29, 13, 7, 9, 12, 29, 12, 5, 38, 30, 47, 47, 33, 35, 13, 25, 26, 14, 42, 35, 15, 23, 45, 9, 25, 32, 49, 33, 26, 52, 41, 14, 38, 36, 47, 23, 38, 9, 46, 25, 44, 58, 19, 14, 43, 16, 56, 57, 49, 37, 46, 41, 47, 23, 50, 66, 43, 40, 56, 56, 56, 74, 61, 54, 25, 61, 13, 57, 58, 32, 57, 32, 67, 63, 69, 76, 68, 76, 61, 81, 79, 68, 88, 93, 81, 84, 95] 0

k\_1000 434

opm 75

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_4.sm case j1204\_4.sm

64 722.5794339179993 s [77, 87] 2.666666666666667 [0, 0, 0, 1, 1, 6, 1, 10, 15, 14, 6, 10, 10, 4, 17, 10, 18, 15, 18, 12, 20, 14, 22, 15, 12, 22, 17, 19, 6, 12, 22, 10, 12, 30, 18, 39, 20, 24, 19, 12, 23, 30, 22, 14, 25, 40, 38, 33, 10, 30, 20, 38, 26, 15, 47, 30, 30, 35, 12, 20, 38, 32, 25, 25, 32, 22, 15, 30, 30, 40, 35, 30, 44, 27, 28, 14, 30, 20, 48, 40, 41, 49, 24, 45, 45, 37, 30, 53, 40, 51, 12, 48, 25, 53, 45, 35, 49, 49, 42, 47, 62, 36, 54, 49, 50, 58, 47, 65, 53, 59, 53, 29, 62, 56, 59, 62, 65, 60, 16, 72, 71, 77] 0

k\_1000 435

opm 74

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_5.sm case j1204\_5.sm

35 413.00939655303955 s [74, 89] 0.0 [0, 0, 0, 0, 4, 7, 6, 1, 1, 9, 6, 4, 6, 11, 15, 1, 14, 15, 22, 11, 8, 9, 15, 16, 33, 22, 11, 8, 11, 7, 10, 11, 9, 9, 22, 16, 20, 14, 8, 26, 13, 13, 22, 11, 13, 35, 32, 22, 21, 39, 25, 16, 25, 31, 13, 17, 22, 31, 31, 16, 26, 19, 40, 4, 31, 40, 29, 31, 17, 33, 18, 36, 34, 33, 35, 23, 22, 43, 29, 33, 32, 39, 41, 42, 47, 41, 17, 49, 34, 26, 41, 46, 26, 42, 50, 40, 40, 47, 43, 53, 50, 44, 55, 56, 45, 54, 59, 22, 38, 50, 51, 54, 57, 48, 58, 61, 58, 54, 68, 64, 65, 74] 0

k\_1000 436

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_6.sm case j1204\_6.sm

23 219.6090064048767 s [90, 102] 0.0 [0, 0, 0, 0, 2, 10, 5, 19, 18, 10, 26, 28, 26, 10, 26, 18, 7, 27, 2, 10, 27, 12, 7, 18, 30, 26, 37, 28, 27, 11, 37, 2, 38, 26, 28, 36, 13, 22, 36, 28, 42, 7, 11, 19, 20, 45, 30, 20, 46, 26, 32, 12, 28, 37, 24, 47, 24, 76, 42, 5, 36, 33, 20, 12, 36, 62, 22, 22, 72, 7, 13, 46, 44, 43, 42, 42, 25, 42, 48, 33, 50, 20, 54, 34, 63, 44, 51, 51, 81, 47, 5, 59, 54, 48, 48, 59, 33, 48, 33, 24, 21, 59, 50, 65, 56, 56, 56, 84, 59, 69, 76, 61, 63, 72, 86, 81, 82, 56, 87, 85, 55, 90] 0

k\_1000 437

opm 81

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_7.sm case j1204\_7.sm

44 365.4918417930603 s [81, 99] 0.0 [0, 0, 0, 0, 6, 6, 6, 6, 9, 5, 10, 6, 16, 14, 60, 22, 9, 15, 16, 31, 9, 17, 6, 9, 26, 17, 17, 26, 14, 19, 9, 21, 17, 25, 15, 20, 25, 27, 19, 35, 23, 16, 37, 19, 20, 14, 10, 23, 39, 14, 23, 41, 23, 23, 16, 33, 30, 27, 26, 32, 22, 27, 23, 31, 31, 31, 39, 35, 41, 12, 41, 37, 25, 13, 28, 39, 31, 40, 41, 23, 5, 44, 37, 41, 41, 51, 50, 36, 50, 31, 43, 50, 44, 54, 31, 44, 40, 36, 50, 44, 58, 60, 70, 65, 46, 67, 39, 52, 61, 45, 54, 76, 77, 52, 62, 67, 51, 59, 78, 71, 62, 81] 0

k\_1000 438

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_8.sm case j1204\_8.sm

7 43.14069843292236 s [90, 124] 0.0 [0, 0, 0, 0, 4, 9, 9, 9, 14, 11, 10, 17, 10, 17, 27, 23, 11, 21, 35, 30, 19, 36, 14, 23, 28, 19, 21, 19, 36, 14, 27, 18, 14, 41, 1, 27, 28, 19, 10, 29, 48, 25, 30, 48, 48, 36, 18, 11, 51, 43, 17, 53, 34, 42, 18, 56, 37, 29, 28, 46, 37, 29, 34, 31, 25, 18, 48, 36, 37, 46, 32, 38, 21, 10, 26, 35, 38, 24, 56, 49, 41, 51, 29, 34, 41, 30, 28, 39, 56, 56, 60, 48, 53, 39, 55, 59, 48, 31, 28, 1, 59, 66, 56, 17, 59, 56, 45, 68, 65, 56, 66, 67, 59, 66, 48, 73, 73, 78, 79, 82, 52, 90] 0

k\_1000 439

opm 79

the random choice case path in j120 ./rcpsp/j120.sm/j1204\_9.sm case j1204\_9.sm

6 49.45602035522461 s [79, 106] 0.0 [0, 0, 0, 0, 6, 9, 4, 16, 16, 6, 24, 8, 6, 18, 21, 29, 10, 14, 18, 9, 35, 19, 12, 22, 16, 23, 36, 9, 16, 4, 26, 19, 21, 21, 31, 36, 36, 35, 37, 35, 39, 8, 31, 12, 30, 44, 23, 19, 39, 21, 12, 44, 47, 16, 23, 43, 16, 37, 18, 39, 19, 45, 44, 26, 21, 25, 9, 43, 53, 37, 44, 25, 26, 12, 45, 24, 28, 35, 32, 43, 43, 53, 29, 55, 10, 61, 13, 50, 52, 46, 40, 13, 46, 63, 49, 53, 36, 47, 46, 52, 65, 53, 38, 54, 45, 29, 63, 57, 55, 44, 58, 54, 65, 21, 45, 61, 62, 62, 68, 64, 70, 79] 0

k\_1000 440

opm 116

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_1.sm case j12050\_1.sm

20 118.28732562065125 s [116, 134] 0.0 [0, 0, 0, 0, 2, 2, 8, 12, 10, 2, 19, 26, 28, 14, 28, 19, 26, 31, 14, 39, 14, 47, 26, 47, 27, 39, 52, 11, 12, 59, 32, 28, 61, 38, 27, 53, 31, 19, 59, 35, 52, 48, 38, 31, 55, 24, 48, 63, 53, 38, 62, 64, 56, 32, 60, 35, 72, 59, 61, 65, 72, 57, 47, 50, 47, 61, 53, 82, 62, 71, 63, 89, 78, 64, 71, 71, 64, 92, 65, 65, 75, 65, 81, 75, 75, 57, 85, 81, 66, 81, 92, 81, 75, 98, 98, 85, 69, 81, 12, 99, 86, 105, 80, 94, 85, 65, 80, 79, 109, 75, 84, 99, 88, 93, 89, 102, 105, 105, 113, 107, 108, 116] 0

k\_1000 441

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_10.sm case j12050\_10.sm

74 714.0876615047455 s [107, 173] 3.8834951456310676 [0, 0, 0, 0, 10, 8, 12, 17, 18, 13, 26, 58, 20, 13, 10, 22, 13, 17, 13, 18, 26, 39, 26, 19, 9, 20, 35, 35, 29, 20, 33, 26, 20, 20, 26, 26, 18, 20, 20, 44, 35, 30, 38, 31, 38, 39, 38, 10, 25, 42, 9, 40, 33, 51, 46, 42, 48, 18, 31, 37, 40, 48, 49, 53, 51, 49, 39, 22, 54, 19, 42, 57, 61, 39, 45, 51, 39, 56, 51, 58, 71, 47, 56, 57, 66, 56, 56, 77, 51, 57, 69, 65, 63, 66, 56, 39, 62, 56, 85, 63, 72, 69, 72, 66, 79, 79, 73, 79, 87, 87, 85, 93, 81, 81, 89, 88, 98, 95, 101, 31, 104, 107] 0

k\_1000 442

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_2.sm case j12050\_2.sm

44 714.4884991645813 s [118, 173] 5.357142857142857 [0, 0, 0, 0, 3, 10, 19, 10, 10, 15, 15, 23, 18, 15, 24, 24, 23, 41, 3, 32, 3, 24, 40, 33, 3, 33, 69, 61, 31, 24, 23, 50, 23, 3, 32, 7, 64, 40, 49, 45, 25, 23, 47, 31, 39, 31, 24, 41, 60, 34, 33, 50, 35, 39, 50, 52, 50, 67, 58, 45, 31, 64, 66, 74, 60, 73, 42, 34, 47, 51, 58, 79, 74, 73, 77, 56, 62, 82, 70, 45, 53, 58, 58, 52, 64, 97, 71, 64, 61, 81, 81, 70, 86, 86, 70, 78, 79, 69, 86, 73, 80, 67, 92, 84, 84, 88, 103, 99, 103, 90, 93, 95, 98, 81, 101, 81, 89, 88, 109, 109, 110, 118] 0

k\_1000 443

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_3.sm case j12050\_3.sm

55 722.2519838809967 s [112, 117] 0.9009009009009009 [0, 0, 0, 0, 9, 3, 3, 3, 19, 9, 14, 17, 21, 9, 14, 10, 10, 28, 18, 10, 21, 27, 17, 27, 19, 19, 31, 37, 19, 22, 24, 21, 28, 28, 24, 37, 15, 31, 34, 41, 41, 13, 31, 40, 28, 38, 19, 38, 27, 28, 20, 26, 18, 36, 36, 33, 38, 41, 46, 39, 41, 40, 46, 47, 49, 46, 47, 55, 50, 47, 60, 47, 51, 55, 64, 52, 31, 55, 32, 56, 60, 69, 64, 76, 42, 60, 74, 60, 67, 60, 67, 22, 70, 80, 62, 74, 67, 83, 84, 80, 82, 74, 76, 82, 43, 69, 90, 92, 83, 77, 90, 86, 88, 95, 95, 101, 103, 102, 90, 96, 107, 112] 0

k\_1000 444

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_4.sm case j12050\_4.sm

61 716.3290524482727 s [107, 170] 7.000000000000001 [0, 0, 0, 0, 11, 7, 7, 16, 25, 7, 1, 7, 1, 16, 5, 12, 8, 21, 30, 5, 8, 11, 11, 21, 25, 25, 30, 45, 21, 7, 8, 17, 7, 35, 17, 21, 62, 21, 40, 21, 30, 40, 29, 30, 14, 27, 32, 11, 40, 34, 34, 19, 44, 35, 18, 30, 48, 37, 36, 49, 24, 53, 24, 59, 47, 39, 53, 27, 49, 49, 51, 40, 48, 59, 56, 59, 48, 58, 56, 53, 37, 51, 59, 67, 63, 49, 60, 59, 40, 62, 51, 68, 62, 64, 77, 58, 68, 69, 55, 78, 59, 68, 56, 78, 54, 72, 67, 61, 78, 67, 85, 70, 87, 77, 80, 84, 87, 91, 99, 86, 97, 107] 0

k\_1000 445

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_5.sm case j12050\_5.sm

64 715.7365577220917 s [107, 123] 7.000000000000001 [0, 0, 0, 0, 4, 9, 9, 4, 4, 28, 4, 9, 19, 13, 24, 4, 22, 19, 21, 9, 33, 18, 21, 23, 29, 21, 16, 5, 23, 26, 33, 39, 33, 35, 33, 29, 37, 32, 43, 21, 18, 4, 30, 19, 28, 19, 29, 22, 43, 36, 45, 43, 43, 50, 29, 21, 47, 55, 39, 50, 33, 52, 40, 26, 49, 36, 57, 58, 33, 64, 52, 42, 62, 60, 66, 49, 49, 65, 57, 28, 66, 62, 58, 75, 75, 77, 77, 81, 55, 50, 65, 80, 71, 86, 70, 58, 74, 80, 68, 77, 39, 74, 73, 81, 81, 75, 60, 75, 84, 89, 90, 79, 90, 79, 91, 78, 93, 91, 89, 103, 101, 107] 0

k\_1000 446

opm 102

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_6.sm case j12050\_6.sm

67 710.9564518928528 s [103, 251] 0.9803921568627451 [0, 0, 0, 0, 3, 10, 10, 16, 10, 16, 3, 16, 17, 10, 17, 10, 15, 19, 16, 9, 15, 15, 37, 10, 10, 10, 20, 29, 17, 19, 27, 32, 16, 17, 15, 28, 21, 40, 25, 17, 33, 20, 19, 25, 37, 21, 28, 26, 42, 42, 22, 33, 41, 53, 46, 47, 51, 36, 44, 38, 48, 10, 38, 35, 52, 45, 45, 28, 57, 52, 52, 48, 59, 46, 52, 55, 56, 55, 46, 40, 59, 48, 63, 65, 66, 36, 71, 56, 65, 62, 55, 79, 72, 59, 62, 65, 61, 66, 63, 66, 61, 72, 76, 71, 81, 65, 73, 71, 73, 72, 79, 87, 83, 46, 77, 83, 77, 91, 93, 93, 74, 103] 0

k\_1000 447

opm 137

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_7.sm case j12050\_7.sm

0 9.569396257400513 s [137, 250] 0.0 [0, 0, 0, 0, 10, 10, 11, 19, 19, 5, 21, 11, 31, 5, 11, 41, 43, 43, 21, 19, 17, 40, 9, 17, 31, 23, 33, 33, 33, 53, 10, 17, 53, 46, 31, 7, 53, 50, 65, 25, 53, 59, 50, 39, 18, 60, 17, 71, 59, 54, 71, 63, 18, 63, 59, 66, 46, 69, 65, 72, 72, 71, 43, 72, 71, 79, 73, 31, 85, 23, 72, 63, 31, 82, 39, 88, 94, 78, 69, 73, 43, 41, 80, 76, 82, 63, 47, 79, 81, 91, 83, 88, 90, 91, 91, 93, 92, 101, 101, 84, 93, 98, 105, 83, 113, 120, 101, 85, 100, 108, 98, 104, 104, 107, 89, 94, 114, 126, 131, 104, 120, 137] 0

k\_1000 448

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_8.sm case j12050\_8.sm

17 207.40223002433777 s [112, 124] 0.0 [0, 0, 0, 0, 4, 4, 4, 3, 12, 11, 10, 10, 19, 28, 14, 17, 15, 10, 29, 19, 5, 38, 5, 17, 21, 25, 28, 17, 31, 13, 23, 35, 19, 3, 21, 33, 11, 38, 26, 23, 18, 31, 33, 26, 28, 15, 33, 37, 45, 53, 13, 27, 30, 15, 27, 24, 51, 24, 39, 37, 18, 26, 43, 43, 33, 41, 53, 40, 46, 48, 48, 49, 47, 41, 49, 29, 58, 51, 57, 57, 59, 59, 37, 59, 45, 49, 39, 57, 31, 67, 61, 62, 59, 72, 60, 68, 59, 76, 80, 66, 75, 89, 59, 64, 66, 63, 68, 75, 76, 72, 79, 83, 64, 71, 98, 70, 89, 81, 104, 91, 86, 112] 0

k\_1000 449

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12050\_9.sm case j12050\_9.sm

63 714.9839613437653 s [102, 114] 0.9900990099009901 [0, 0, 0, 0, 1, 6, 3, 3, 12, 17, 13, 6, 9, 3, 17, 17, 6, 23, 11, 9, 15, 23, 12, 9, 12, 1, 6, 33, 15, 6, 21, 18, 30, 27, 21, 21, 11, 21, 17, 23, 29, 41, 32, 18, 17, 34, 10, 34, 1, 38, 19, 46, 29, 34, 19, 31, 31, 25, 48, 36, 47, 32, 48, 25, 46, 46, 57, 44, 51, 28, 34, 46, 37, 64, 31, 36, 27, 27, 66, 54, 40, 25, 31, 58, 60, 40, 63, 51, 34, 59, 21, 68, 59, 67, 68, 59, 61, 61, 65, 68, 66, 78, 77, 75, 70, 70, 76, 82, 47, 85, 76, 82, 86, 57, 79, 67, 90, 91, 101, 97, 86, 102] 0

k\_1000 450

opm 206

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_1.sm case j12051\_1.sm

11 812.4848232269287 s [248, 271] 20.388349514563107 [0, 0, 0, 1, 9, 19, 17, 9, 18, 33, 1, 28, 18, 17, 42, 60, 43, 33, 24, 72, 12, 9, 28, 68, 82, 45, 84, 68, 103, 25, 39, 39, 52, 37, 45, 70, 49, 88, 49, 113, 37, 49, 123, 38, 60, 63, 93, 139, 78, 106, 70, 129, 106, 113, 132, 122, 109, 58, 76, 58, 97, 93, 76, 123, 42, 99, 147, 99, 100, 129, 139, 100, 112, 122, 103, 147, 184, 150, 71, 139, 181, 159, 151, 159, 198, 164, 174, 175, 156, 184, 188, 199, 164, 213, 168, 181, 177, 195, 185, 140, 193, 174, 218, 196, 168, 213, 179, 205, 227, 205, 218, 232, 218, 226, 237, 196, 205, 213, 236, 237, 239, 248] 0

k\_1000 451

opm 225

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_10.sm case j12051\_10.sm

11 864.4462721347809 s [265, 1893] 17.77777777777778 [0, 0, 0, 0, 106, 19, 8, 6, 27, 8, 17, 48, 37, 7, 10, 23, 44, 27, 17, 47, 33, 59, 33, 52, 7, 43, 83, 55, 72, 35, 48, 11, 63, 39, 55, 44, 77, 120, 59, 113, 84, 119, 15, 95, 63, 89, 81, 7, 93, 128, 48, 113, 134, 129, 103, 137, 98, 101, 150, 89, 134, 95, 63, 58, 151, 167, 143, 108, 103, 106, 172, 108, 155, 71, 174, 172, 158, 190, 139, 175, 167, 167, 185, 212, 68, 113, 160, 120, 149, 150, 173, 204, 212, 219, 129, 180, 159, 185, 187, 148, 142, 199, 215, 158, 172, 222, 173, 202, 223, 215, 220, 247, 238, 210, 224, 192, 247, 230, 254, 254, 255, 265] 0

k\_1000 452

opm 221

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_2.sm case j12051\_2.sm

11 862.6151578426361 s [268, 611] 21.266968325791854 [0, 0, 0, 0, 16, 9, 2, 33, 43, 10, 43, 23, 2, 51, 51, 3, 62, 12, 60, 51, 23, 11, 12, 77, 33, 35, 41, 86, 95, 18, 46, 111, 68, 77, 118, 121, 128, 110, 43, 60, 85, 116, 65, 86, 101, 65, 154, 126, 144, 32, 3, 95, 157, 101, 62, 68, 126, 166, 33, 108, 139, 160, 69, 167, 168, 103, 161, 178, 178, 196, 77, 141, 167, 126, 161, 132, 66, 134, 170, 154, 170, 191, 144, 185, 108, 210, 170, 191, 132, 221, 201, 111, 140, 236, 168, 250, 207, 201, 225, 202, 129, 212, 251, 225, 242, 218, 258, 217, 210, 161, 234, 225, 124, 217, 263, 242, 228, 233, 267, 242, 263, 268] 0

k\_1000 453

opm 219

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_3.sm case j12051\_3.sm

15 740.6341078281403 s [250, 1129] 14.15525114155251 [0, 0, 8, 15, 19, 17, 21, 21, 8, 25, 36, 25, 8, 29, 39, 36, 42, 19, 45, 69, 49, 77, 72, 82, 56, 8, 56, 82, 21, 19, 26, 106, 24, 45, 17, 29, 39, 42, 39, 31, 51, 63, 87, 93, 48, 56, 93, 58, 89, 67, 81, 107, 107, 69, 119, 143, 121, 149, 72, 128, 128, 89, 133, 158, 89, 144, 82, 98, 112, 138, 164, 98, 106, 176, 133, 117, 63, 41, 56, 154, 89, 180, 203, 149, 210, 136, 176, 167, 194, 122, 183, 144, 126, 172, 207, 186, 225, 203, 215, 194, 162, 194, 158, 202, 166, 186, 215, 198, 209, 199, 228, 238, 228, 167, 233, 212, 203, 218, 228, 243, 242, 250] 0

k\_1000 454

opm 211

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_4.sm case j12051\_4.sm

11 1257.7151324748993 s [261, 1942] 23.696682464454977 [0, 0, 6, 0, 15, 8, 23, 60, 8, 27, 19, 43, 2, 16, 14, 32, 32, 33, 4, 6, 26, 49, 37, 18, 87, 76, 37, 39, 20, 56, 15, 27, 27, 87, 35, 40, 35, 85, 50, 106, 49, 119, 60, 79, 39, 117, 66, 40, 56, 49, 69, 105, 113, 117, 116, 157, 107, 26, 113, 50, 126, 96, 164, 106, 168, 66, 126, 136, 95, 132, 132, 152, 144, 228, 95, 136, 119, 63, 184, 135, 159, 148, 70, 127, 235, 142, 189, 173, 193, 218, 183, 96, 176, 144, 142, 193, 199, 148, 159, 150, 184, 208, 228, 218, 243, 200, 209, 218, 235, 236, 243, 199, 228, 253, 249, 239, 233, 208, 257, 256, 244, 261] 0

k\_1000 455

opm 229

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_5.sm case j12051\_5.sm

11 759.2804551124573 s [280, 1942] 22.270742358078603 [0, 0, 26, 0, 9, 6, 18, 34, 9, 24, 24, 9, 9, 34, 16, 16, 34, 42, 39, 42, 67, 39, 47, 51, 59, 56, 61, 67, 16, 76, 84, 91, 91, 48, 47, 111, 106, 74, 84, 66, 120, 84, 97, 42, 107, 132, 91, 65, 67, 66, 132, 122, 223, 11, 113, 24, 59, 111, 42, 97, 141, 239, 199, 120, 129, 146, 149, 200, 49, 187, 159, 200, 107, 141, 154, 205, 162, 134, 76, 162, 169, 142, 98, 173, 100, 142, 149, 150, 178, 200, 182, 173, 205, 127, 203, 187, 212, 219, 190, 229, 236, 243, 162, 229, 197, 230, 239, 206, 207, 223, 242, 246, 242, 256, 242, 210, 253, 267, 275, 261, 250, 280] 0

k\_1000 456

opm 215

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_6.sm case j12051\_6.sm

11 756.5291287899017 s [254, 300] 18.13953488372093 [0, 2, 0, 0, 7, 12, 32, 7, 23, 17, 26, 19, 17, 64, 23, 34, 35, 37, 42, 34, 12, 42, 14, 48, 40, 55, 57, 15, 58, 70, 55, 42, 74, 136, 70, 93, 48, 79, 148, 74, 79, 57, 91, 118, 7, 68, 105, 101, 112, 109, 118, 139, 52, 83, 110, 160, 32, 120, 165, 128, 186, 171, 128, 25, 171, 52, 101, 133, 55, 88, 102, 196, 206, 85, 180, 126, 105, 95, 110, 203, 165, 157, 205, 172, 182, 139, 150, 145, 165, 154, 215, 180, 179, 127, 196, 127, 133, 192, 215, 148, 182, 205, 187, 157, 187, 189, 135, 201, 196, 208, 190, 215, 217, 219, 236, 220, 225, 226, 224, 246, 225, 254] 0

k\_1000 457

opm 212

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_7.sm case j12051\_7.sm

11 763.1517968177795 s [236, 242] 11.320754716981133 [0, 0, 0, 0, 5, 14, 16, 26, 5, 92, 26, 9, 11, 27, 36, 44, 19, 15, 51, 58, 46, 14, 76, 51, 112, 68, 16, 9, 85, 68, 85, 46, 19, 68, 106, 33, 79, 29, 16, 93, 76, 29, 88, 95, 89, 49, 36, 73, 44, 36, 85, 78, 19, 106, 44, 58, 120, 120, 127, 119, 128, 60, 149, 68, 101, 132, 132, 55, 143, 145, 117, 161, 117, 120, 171, 146, 111, 146, 106, 134, 138, 127, 93, 149, 132, 155, 152, 161, 168, 173, 172, 180, 176, 147, 167, 168, 134, 173, 176, 151, 182, 102, 192, 180, 186, 180, 205, 158, 196, 205, 192, 208, 216, 196, 173, 218, 225, 220, 210, 220, 228, 236] 0

k\_1000 458

opm 206

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_8.sm case j12051\_8.sm

12 758.6700599193573 s [237, 3333] 15.048543689320388 [0, 0, 0, 0, 9, 1, 1, 12, 3, 5, 35, 28, 6, 20, 18, 6, 9, 20, 15, 11, 26, 24, 41, 26, 65, 55, 45, 74, 34, 39, 48, 74, 64, 18, 48, 67, 24, 80, 38, 38, 78, 64, 25, 49, 77, 74, 55, 91, 89, 89, 103, 38, 101, 102, 61, 51, 23, 93, 93, 88, 102, 61, 104, 67, 125, 104, 132, 125, 117, 106, 117, 130, 117, 140, 66, 127, 142, 133, 126, 149, 108, 132, 149, 154, 110, 159, 148, 186, 156, 125, 168, 144, 109, 176, 175, 154, 188, 112, 206, 196, 195, 169, 186, 196, 168, 214, 162, 208, 206, 222, 188, 176, 198, 214, 214, 230, 222, 190, 231, 227, 223, 237] 0

k\_1000 459

opm 210

the random choice case path in j120 ./rcpsp/j120.sm/j12051\_9.sm case j12051\_9.sm

12 733.9283695220947 s [252, 508] 20.0 [0, 0, 8, 0, 14, 14, 18, 9, 18, 15, 9, 31, 16, 32, 26, 20, 44, 32, 70, 91, 32, 49, 54, 64, 60, 60, 27, 19, 85, 78, 78, 99, 44, 42, 62, 99, 15, 64, 31, 108, 40, 107, 90, 112, 104, 117, 145, 52, 104, 119, 99, 73, 127, 40, 136, 83, 114, 136, 128, 112, 118, 172, 146, 127, 107, 58, 163, 134, 145, 174, 176, 153, 153, 164, 154, 134, 207, 139, 195, 176, 64, 127, 149, 172, 167, 181, 180, 195, 218, 203, 158, 154, 181, 151, 215, 219, 181, 186, 181, 182, 168, 203, 213, 216, 193, 201, 207, 216, 223, 228, 210, 239, 234, 228, 229, 236, 236, 186, 245, 247, 245, 252] 0

k\_1000 460

opm 176

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_1.sm case j12052\_1.sm

12 749.7081897258759 s [204, 389] 15.909090909090908 [0, 0, 0, 7, 12, 69, 79, 18, 26, 26, 36, 56, 44, 4, 88, 46, 90, 10, 26, 89, 7, 92, 53, 95, 17, 79, 33, 19, 4, 54, 72, 27, 17, 85, 36, 15, 65, 40, 67, 27, 11, 51, 60, 89, 94, 102, 11, 57, 51, 85, 12, 115, 104, 102, 82, 43, 84, 65, 54, 72, 109, 103, 112, 104, 112, 107, 115, 46, 109, 102, 23, 112, 121, 123, 108, 131, 158, 131, 140, 123, 140, 136, 130, 123, 140, 142, 137, 142, 147, 144, 155, 150, 165, 151, 172, 160, 151, 175, 158, 150, 168, 163, 163, 178, 177, 147, 177, 177, 161, 183, 183, 188, 172, 84, 183, 187, 187, 193, 194, 189, 196, 204] 0

k\_1000 461

opm 143

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_10.sm case j12052\_10.sm

19 705.9243240356445 s [167, 209] 16.783216783216783 [0, 0, 0, 0, 10, 5, 5, 6, 7, 16, 19, 11, 59, 4, 16, 10, 20, 11, 27, 14, 20, 40, 12, 59, 40, 44, 28, 20, 44, 30, 59, 30, 78, 20, 67, 27, 41, 10, 41, 50, 20, 92, 78, 110, 14, 15, 69, 28, 54, 51, 28, 54, 71, 92, 64, 87, 85, 88, 100, 82, 77, 69, 71, 72, 79, 92, 30, 98, 53, 110, 98, 113, 77, 124, 113, 102, 106, 53, 99, 100, 154, 103, 108, 117, 118, 96, 107, 133, 110, 115, 117, 124, 130, 100, 126, 30, 126, 113, 118, 140, 135, 140, 124, 103, 148, 108, 125, 146, 133, 144, 133, 148, 152, 140, 129, 144, 148, 158, 162, 162, 158, 167] 0

k\_1000 462

opm 183

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_2.sm case j12052\_2.sm

15 768.5424809455872 s [208, 232] 13.661202185792352 [0, 0, 0, 0, 3, 6, 8, 16, 8, 29, 16, 5, 13, 25, 8, 18, 35, 38, 20, 35, 39, 30, 25, 42, 21, 48, 48, 42, 48, 60, 60, 53, 64, 51, 60, 41, 70, 57, 64, 86, 73, 77, 73, 84, 90, 77, 81, 70, 49, 63, 90, 74, 87, 80, 53, 91, 53, 91, 97, 96, 109, 81, 91, 108, 113, 51, 114, 97, 110, 114, 122, 127, 100, 124, 129, 121, 129, 97, 131, 113, 103, 120, 139, 134, 131, 145, 114, 137, 124, 103, 152, 135, 148, 145, 139, 152, 158, 154, 153, 107, 166, 163, 156, 177, 177, 107, 147, 166, 163, 176, 184, 182, 164, 186, 172, 184, 190, 191, 156, 200, 199, 208] 0

k\_1000 463

opm 134

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_3.sm case j12052\_3.sm

23 725.6197214126587 s [152, 465] 13.432835820895523 [0, 0, 0, 0, 1, 6, 9, 6, 6, 6, 10, 8, 8, 10, 32, 11, 7, 13, 22, 27, 48, 15, 11, 35, 14, 18, 14, 51, 27, 26, 15, 36, 46, 11, 23, 44, 38, 21, 6, 50, 25, 77, 40, 61, 43, 36, 70, 45, 33, 25, 36, 44, 69, 36, 38, 83, 52, 58, 42, 57, 57, 78, 61, 70, 47, 42, 58, 61, 40, 118, 89, 66, 103, 86, 90, 94, 51, 87, 70, 69, 63, 110, 78, 57, 90, 99, 96, 118, 87, 103, 118, 106, 128, 85, 94, 113, 61, 104, 98, 70, 94, 72, 107, 121, 110, 134, 109, 116, 87, 95, 129, 127, 121, 138, 104, 127, 137, 127, 145, 121, 144, 152] 0

k\_1000 464

opm 170

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_4.sm case j12052\_4.sm

16 723.790290594101 s [198, 204] 16.470588235294116 [0, 0, 0, 0, 8, 8, 9, 11, 17, 22, 11, 51, 69, 30, 34, 44, 22, 31, 31, 40, 40, 8, 76, 9, 36, 24, 49, 81, 28, 40, 76, 33, 44, 101, 110, 65, 40, 47, 31, 78, 87, 123, 11, 54, 55, 16, 62, 41, 120, 17, 69, 84, 43, 84, 22, 74, 50, 65, 59, 97, 87, 65, 62, 68, 87, 130, 136, 94, 93, 105, 28, 124, 117, 114, 94, 97, 146, 101, 136, 150, 150, 95, 144, 157, 142, 126, 106, 117, 135, 138, 120, 154, 155, 140, 136, 162, 165, 128, 81, 146, 126, 189, 154, 158, 165, 156, 139, 159, 162, 175, 182, 195, 182, 183, 163, 193, 173, 165, 195, 180, 196, 198] 0

k\_1000 465

opm 168

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_5.sm case j12052\_5.sm

14 775.0651953220367 s [195, 223] 16.071428571428573 [0, 0, 0, 74, 9, 14, 14, 30, 14, 5, 12, 5, 40, 18, 12, 24, 25, 18, 21, 49, 42, 68, 58, 50, 32, 30, 20, 94, 21, 32, 49, 31, 22, 50, 24, 61, 41, 98, 60, 39, 55, 92, 64, 5, 89, 80, 56, 68, 64, 39, 54, 58, 31, 94, 90, 71, 81, 39, 48, 48, 48, 56, 102, 104, 132, 83, 101, 83, 105, 113, 74, 133, 117, 133, 109, 83, 83, 80, 111, 110, 122, 122, 125, 132, 137, 114, 149, 111, 150, 145, 152, 156, 119, 120, 114, 118, 102, 120, 134, 117, 156, 168, 164, 139, 96, 102, 125, 129, 158, 168, 110, 124, 116, 149, 178, 176, 164, 176, 184, 185, 185, 195] 0

k\_1000 466

opm 196

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_6.sm case j12052\_6.sm

20 731.7530963420868 s [225, 525] 14.795918367346939 [0, 0, 0, 0, 7, 8, 8, 16, 15, 17, 27, 30, 53, 36, 14, 72, 16, 45, 63, 92, 46, 53, 56, 38, 65, 65, 22, 61, 46, 36, 82, 73, 117, 82, 94, 99, 119, 20, 99, 20, 103, 27, 62, 117, 98, 73, 23, 53, 116, 20, 117, 122, 123, 83, 107, 113, 85, 92, 91, 83, 118, 91, 116, 122, 132, 108, 50, 53, 133, 92, 119, 132, 65, 132, 135, 135, 139, 140, 157, 166, 117, 167, 166, 140, 177, 145, 154, 155, 145, 157, 151, 155, 163, 146, 167, 166, 159, 151, 160, 174, 177, 182, 186, 186, 171, 192, 173, 192, 202, 190, 196, 206, 178, 199, 192, 206, 158, 210, 215, 215, 180, 225] 0

k\_1000 467

opm 149

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_7.sm case j12052\_7.sm

23 703.0620744228363 s [161, 263] 8.053691275167784 [0, 0, 12, 0, 4, 8, 8, 36, 73, 4, 7, 7, 14, 7, 17, 11, 68, 7, 26, 43, 11, 19, 16, 40, 15, 50, 35, 57, 38, 26, 16, 72, 50, 29, 16, 48, 29, 59, 50, 43, 49, 82, 14, 22, 85, 7, 91, 29, 36, 64, 76, 100, 45, 57, 48, 49, 72, 50, 65, 69, 91, 80, 81, 59, 80, 95, 90, 98, 73, 40, 81, 19, 100, 98, 32, 98, 76, 103, 69, 94, 86, 86, 110, 111, 107, 97, 105, 118, 121, 105, 91, 111, 103, 132, 130, 122, 121, 130, 132, 130, 101, 139, 135, 139, 146, 105, 102, 133, 136, 122, 146, 118, 140, 146, 146, 135, 141, 153, 147, 150, 157, 161] 0

k\_1000 468

opm 158

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_8.sm case j12052\_8.sm

21 740.212094783783 s [186, 204] 17.72151898734177 [0, 0, 0, 0, 6, 5, 15, 5, 9, 23, 11, 11, 6, 23, 14, 26, 5, 33, 30, 21, 15, 23, 14, 9, 28, 41, 58, 65, 52, 62, 41, 50, 46, 23, 50, 15, 34, 65, 18, 32, 65, 73, 25, 33, 40, 82, 20, 79, 54, 84, 102, 25, 66, 92, 50, 32, 102, 67, 76, 52, 10, 55, 76, 79, 73, 100, 82, 59, 90, 79, 109, 118, 67, 116, 66, 84, 120, 56, 91, 91, 79, 134, 128, 101, 125, 136, 92, 109, 110, 79, 125, 128, 116, 134, 91, 137, 88, 126, 142, 146, 132, 154, 141, 116, 153, 161, 126, 143, 147, 153, 154, 145, 163, 172, 145, 114, 171, 137, 179, 179, 162, 186] 0

k\_1000 469

opm 150

the random choice case path in j120 ./rcpsp/j120.sm/j12052\_9.sm case j12052\_9.sm

25 712.0799341201782 s [164, 812] 9.333333333333334 [0, 0, 0, 19, 9, 26, 8, 9, 9, 32, 11, 26, 33, 40, 30, 30, 34, 17, 32, 26, 47, 20, 40, 17, 17, 47, 8, 35, 25, 54, 12, 22, 36, 36, 56, 44, 32, 14, 19, 62, 28, 47, 69, 34, 25, 64, 73, 11, 59, 52, 76, 19, 27, 72, 38, 53, 81, 29, 79, 56, 77, 87, 82, 90, 83, 47, 62, 52, 64, 100, 93, 44, 83, 79, 80, 104, 90, 114, 98, 61, 102, 93, 80, 103, 100, 105, 52, 108, 120, 59, 115, 106, 98, 105, 73, 129, 112, 114, 115, 108, 114, 123, 122, 59, 128, 117, 118, 134, 76, 138, 129, 137, 138, 148, 137, 154, 145, 108, 154, 158, 154, 164] 0

k\_1000 470

opm 144

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_1.sm case j12053\_1.sm

30 699.4907784461975 s [163, 249] 13.194444444444445 [0, 0, 0, 0, 8, 6, 7, 6, 8, 9, 1, 30, 31, 22, 32, 35, 12, 45, 12, 1, 23, 34, 25, 48, 6, 40, 23, 59, 47, 13, 47, 44, 8, 18, 27, 31, 66, 14, 30, 56, 48, 25, 33, 53, 57, 66, 38, 39, 55, 51, 74, 38, 77, 40, 56, 54, 73, 6, 6, 33, 42, 78, 77, 79, 66, 65, 81, 81, 86, 79, 88, 88, 102, 79, 89, 95, 116, 66, 55, 74, 89, 97, 81, 83, 106, 89, 68, 95, 84, 97, 90, 107, 102, 102, 102, 111, 101, 108, 107, 102, 116, 124, 132, 108, 101, 114, 117, 108, 126, 124, 123, 117, 130, 135, 144, 135, 146, 109, 153, 123, 136, 163] 0

k\_1000 471

opm 132

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_10.sm case j12053\_10.sm

28 732.1770141124725 s [147, 205] 11.363636363636363 [0, 0, 0, 0, 6, 6, 7, 17, 7, 7, 34, 3, 5, 18, 9, 12, 36, 9, 17, 6, 23, 18, 13, 41, 27, 41, 27, 24, 41, 26, 46, 47, 34, 34, 9, 54, 47, 41, 48, 32, 34, 61, 58, 43, 35, 14, 43, 51, 45, 44, 22, 48, 68, 48, 62, 66, 61, 61, 62, 52, 66, 58, 44, 56, 68, 69, 72, 68, 75, 68, 36, 72, 80, 80, 82, 75, 107, 80, 75, 98, 85, 89, 82, 90, 70, 99, 79, 102, 52, 112, 75, 86, 102, 96, 96, 86, 102, 112, 91, 88, 108, 18, 97, 115, 114, 99, 110, 126, 117, 117, 125, 128, 115, 112, 117, 132, 133, 130, 140, 136, 128, 147] 0

k\_1000 472

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_2.sm case j12053\_2.sm

25 724.6818282604218 s [135, 149] 17.391304347826086 [0, 0, 0, 0, 6, 6, 7, 12, 9, 15, 2, 2, 63, 12, 17, 9, 21, 20, 8, 29, 7, 35, 17, 14, 25, 39, 17, 35, 31, 52, 23, 21, 29, 48, 8, 36, 23, 43, 29, 48, 25, 29, 6, 52, 43, 93, 31, 43, 55, 60, 40, 42, 41, 12, 33, 75, 33, 39, 90, 61, 40, 35, 93, 80, 33, 2, 63, 41, 99, 70, 75, 29, 51, 75, 57, 67, 70, 77, 57, 89, 101, 71, 57, 86, 43, 89, 66, 67, 79, 89, 72, 86, 70, 71, 90, 80, 79, 86, 102, 67, 84, 112, 108, 93, 99, 105, 106, 87, 116, 95, 106, 95, 112, 111, 102, 78, 120, 105, 129, 122, 118, 135] 0

k\_1000 473

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_3.sm case j12053\_3.sm

30 711.6699318885803 s [131, 167] 16.964285714285715 [0, 0, 0, 0, 8, 4, 8, 21, 12, 35, 12, 17, 16, 12, 35, 25, 25, 21, 23, 19, 35, 42, 26, 17, 19, 21, 26, 26, 30, 37, 25, 32, 27, 41, 39, 37, 35, 22, 32, 73, 30, 32, 47, 34, 75, 58, 35, 70, 50, 42, 47, 64, 76, 47, 45, 56, 41, 56, 66, 47, 52, 64, 7, 52, 73, 67, 47, 30, 76, 80, 56, 64, 66, 62, 67, 93, 62, 52, 102, 59, 74, 65, 79, 85, 61, 78, 98, 78, 102, 79, 105, 78, 83, 82, 87, 87, 85, 87, 96, 93, 95, 101, 83, 99, 107, 116, 85, 107, 99, 107, 78, 94, 95, 107, 108, 120, 121, 116, 129, 125, 108, 131] 0

k\_1000 474

opm 145

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_4.sm case j12053\_4.sm

28 743.4496495723724 s [173, 196] 19.310344827586206 [0, 0, 0, 0, 10, 7, 16, 25, 25, 25, 35, 10, 35, 36, 43, 31, 11, 37, 62, 30, 31, 36, 1, 61, 47, 44, 51, 1, 20, 16, 5, 69, 8, 13, 64, 43, 55, 40, 53, 61, 79, 51, 62, 68, 68, 92, 7, 8, 55, 72, 82, 85, 70, 70, 38, 108, 106, 16, 43, 55, 81, 113, 5, 98, 100, 79, 96, 85, 92, 40, 53, 85, 101, 110, 96, 39, 106, 94, 123, 94, 107, 82, 108, 119, 39, 94, 72, 103, 96, 111, 121, 98, 119, 113, 127, 117, 83, 126, 81, 142, 107, 127, 130, 126, 135, 123, 135, 146, 127, 140, 136, 148, 150, 139, 150, 157, 158, 137, 155, 163, 148, 173] 0

k\_1000 475

opm 113

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_5.sm case j12053\_5.sm

30 723.0575976371765 s [130, 196] 15.04424778761062 [0, 0, 0, 0, 7, 4, 1, 1, 1, 22, 1, 11, 7, 9, 16, 13, 9, 24, 4, 7, 32, 17, 11, 14, 27, 46, 28, 10, 14, 25, 29, 22, 7, 22, 22, 37, 9, 24, 32, 16, 9, 43, 48, 62, 11, 22, 16, 46, 16, 17, 47, 54, 60, 31, 70, 24, 38, 43, 37, 54, 31, 70, 40, 49, 80, 38, 71, 36, 50, 75, 60, 92, 22, 71, 67, 54, 75, 67, 47, 60, 70, 61, 73, 54, 38, 73, 80, 78, 50, 83, 75, 78, 72, 84, 82, 92, 82, 79, 94, 87, 104, 97, 103, 94, 107, 109, 94, 103, 103, 80, 107, 91, 107, 114, 114, 48, 107, 108, 118, 122, 96, 130] 0

k\_1000 476

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_6.sm case j12053\_6.sm

33 707.9528772830963 s [114, 180] 7.547169811320755 [0, 0, 0, 0, 1, 1, 4, 4, 1, 15, 5, 25, 23, 23, 7, 9, 8, 5, 4, 7, 5, 26, 1, 1, 9, 15, 6, 33, 23, 8, 17, 20, 17, 4, 26, 35, 50, 28, 37, 14, 38, 27, 33, 35, 42, 31, 28, 35, 45, 26, 49, 47, 31, 57, 43, 57, 17, 47, 58, 68, 67, 27, 42, 68, 58, 47, 44, 39, 60, 44, 46, 79, 56, 68, 56, 58, 62, 48, 68, 69, 38, 69, 45, 84, 49, 74, 78, 84, 48, 72, 70, 85, 69, 69, 72, 84, 94, 74, 82, 91, 89, 97, 89, 81, 91, 79, 91, 94, 92, 104, 81, 100, 92, 100, 99, 106, 107, 105, 106, 113, 108, 114] 0

k\_1000 477

opm 119

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_7.sm case j12053\_7.sm

30 728.4580934047699 s [136, 149] 14.285714285714285 [0, 0, 0, 0, 1, 13, 2, 1, 10, 4, 1, 17, 3, 9, 24, 14, 5, 6, 24, 29, 33, 5, 18, 9, 15, 18, 19, 14, 19, 4, 19, 36, 32, 33, 41, 32, 9, 16, 32, 41, 47, 58, 26, 57, 23, 16, 41, 43, 48, 41, 34, 48, 32, 52, 63, 41, 42, 54, 63, 27, 41, 47, 43, 22, 69, 89, 50, 58, 64, 42, 66, 69, 78, 66, 93, 54, 50, 58, 68, 74, 69, 74, 73, 54, 81, 80, 76, 86, 99, 88, 77, 86, 86, 36, 78, 61, 92, 108, 90, 70, 63, 108, 83, 83, 86, 108, 93, 99, 95, 111, 97, 115, 108, 103, 112, 112, 103, 122, 114, 129, 123, 136] 0

k\_1000 478

opm 139

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_8.sm case j12053\_8.sm

20 743.2504420280457 s [147, 204] 5.755395683453238 [0, 0, 0, 0, 8, 4, 15, 4, 8, 24, 11, 18, 24, 7, 13, 10, 31, 10, 31, 13, 22, 32, 48, 15, 20, 15, 41, 13, 23, 37, 65, 50, 20, 37, 11, 42, 20, 24, 45, 55, 31, 27, 23, 44, 52, 32, 37, 32, 32, 52, 70, 55, 48, 68, 62, 70, 70, 68, 84, 76, 61, 47, 77, 63, 46, 92, 41, 45, 49, 86, 82, 87, 92, 74, 87, 76, 103, 108, 79, 89, 55, 90, 84, 94, 92, 47, 92, 79, 98, 86, 102, 101, 106, 63, 117, 108, 110, 86, 123, 117, 131, 129, 110, 99, 99, 103, 122, 123, 89, 117, 124, 122, 131, 131, 135, 106, 133, 115, 145, 132, 138, 147] 0

k\_1000 479

opm 165

the random choice case path in j120 ./rcpsp/j120.sm/j12053\_9.sm case j12053\_9.sm

17 663.1115231513977 s [196, 273] 18.787878787878785 [0, 0, 0, 0, 10, 10, 15, 24, 2, 35, 15, 2, 24, 22, 7, 15, 48, 37, 2, 44, 22, 58, 22, 15, 62, 44, 22, 39, 7, 44, 31, 25, 46, 76, 63, 35, 25, 33, 68, 51, 31, 71, 76, 86, 43, 52, 25, 52, 71, 81, 67, 61, 102, 107, 61, 43, 51, 77, 95, 91, 92, 91, 93, 95, 96, 107, 5, 113, 86, 107, 117, 113, 125, 130, 97, 135, 89, 120, 132, 97, 123, 125, 135, 126, 117, 132, 143, 102, 107, 136, 122, 140, 154, 143, 140, 107, 136, 130, 155, 119, 152, 140, 152, 121, 144, 158, 143, 159, 107, 152, 166, 154, 168, 174, 180, 159, 187, 160, 165, 150, 192, 196] 0

k\_1000 480

opm 104

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_1.sm case j12054\_1.sm

36 728.252185344696 s [120, 128] 15.384615384615385 [0, 0, 0, 0, 4, 4, 4, 13, 18, 13, 7, 13, 5, 22, 27, 13, 16, 22, 33, 57, 16, 7, 48, 31, 52, 24, 23, 18, 29, 17, 48, 53, 38, 32, 32, 16, 55, 61, 28, 59, 64, 38, 23, 33, 28, 29, 60, 36, 43, 54, 52, 64, 40, 38, 43, 45, 37, 40, 45, 64, 37, 57, 48, 60, 70, 64, 16, 70, 60, 59, 53, 51, 45, 66, 79, 54, 80, 73, 66, 80, 45, 71, 79, 70, 74, 87, 66, 89, 73, 93, 83, 70, 74, 83, 71, 79, 87, 69, 83, 89, 89, 82, 89, 98, 79, 93, 97, 89, 99, 93, 98, 97, 103, 99, 107, 107, 97, 105, 103, 110, 114, 120] 0

k\_1000 481

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_10.sm case j12054\_10.sm

37 703.7033224105835 s [121, 139] 12.037037037037036 [0, 0, 0, 0, 4, 9, 12, 4, 13, 12, 17, 5, 9, 13, 7, 22, 12, 19, 21, 22, 21, 23, 24, 13, 26, 9, 26, 26, 21, 17, 31, 27, 32, 5, 28, 37, 44, 32, 15, 33, 32, 34, 22, 34, 43, 24, 14, 52, 14, 45, 23, 42, 32, 43, 23, 44, 48, 57, 24, 42, 37, 26, 54, 54, 60, 47, 27, 49, 50, 50, 58, 42, 47, 68, 61, 60, 60, 49, 69, 23, 85, 22, 42, 52, 93, 73, 75, 37, 68, 62, 76, 93, 68, 61, 77, 83, 77, 69, 57, 76, 63, 68, 93, 87, 74, 84, 83, 100, 79, 102, 77, 93, 97, 98, 93, 101, 111, 101, 120, 111, 87, 121] 0

k\_1000 482

opm 134

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_2.sm case j12054\_2.sm

43 713.9918835163116 s [135, 167] 0.7462686567164178 [0, 0, 0, 0, 5, 13, 5, 8, 5, 20, 13, 5, 27, 20, 14, 12, 36, 13, 8, 20, 15, 56, 29, 16, 27, 22, 36, 7, 5, 7, 36, 63, 45, 19, 7, 23, 8, 37, 8, 23, 21, 29, 50, 36, 40, 50, 45, 58, 36, 40, 37, 16, 38, 52, 29, 45, 56, 68, 60, 40, 50, 27, 60, 47, 32, 18, 68, 38, 81, 54, 63, 52, 47, 84, 44, 54, 50, 47, 66, 76, 67, 68, 76, 73, 94, 74, 82, 86, 82, 67, 76, 74, 91, 94, 81, 92, 86, 101, 101, 94, 104, 97, 113, 113, 104, 88, 111, 106, 109, 109, 118, 88, 100, 90, 121, 112, 116, 117, 126, 125, 123, 135] 0

k\_1000 483

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_3.sm case j12054\_3.sm

35 705.277074098587 s [117, 123] 5.405405405405405 [0, 0, 0, 0, 1, 4, 2, 4, 29, 1, 7, 16, 18, 4, 16, 13, 19, 7, 18, 2, 22, 27, 11, 19, 16, 28, 31, 9, 13, 20, 49, 31, 31, 19, 43, 32, 36, 49, 29, 59, 7, 22, 31, 41, 23, 23, 31, 37, 36, 9, 41, 11, 37, 22, 43, 39, 61, 64, 37, 41, 31, 43, 49, 38, 29, 32, 54, 33, 59, 33, 61, 52, 45, 57, 61, 54, 70, 50, 39, 54, 61, 69, 54, 61, 69, 70, 78, 72, 61, 43, 79, 67, 67, 77, 47, 57, 52, 61, 58, 72, 79, 82, 72, 64, 88, 70, 83, 79, 78, 86, 82, 88, 83, 92, 101, 89, 90, 98, 99, 108, 89, 117] 0

k\_1000 484

opm 120

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_4.sm case j12054\_4.sm

28 697.2996287345886 s [137, 161] 14.166666666666666 [0, 0, 0, 0, 7, 8, 8, 10, 4, 10, 12, 11, 22, 16, 22, 12, 25, 22, 25, 29, 4, 16, 25, 7, 33, 26, 31, 32, 42, 12, 38, 18, 25, 18, 28, 42, 53, 40, 35, 48, 20, 28, 47, 56, 59, 38, 61, 56, 30, 57, 56, 60, 38, 62, 60, 28, 9, 60, 64, 65, 87, 60, 72, 68, 69, 65, 68, 60, 74, 68, 72, 68, 51, 79, 62, 76, 29, 68, 72, 48, 84, 61, 77, 90, 72, 84, 66, 68, 72, 87, 101, 84, 90, 94, 98, 107, 89, 92, 87, 107, 107, 106, 102, 105, 95, 108, 111, 107, 97, 116, 112, 74, 108, 108, 110, 115, 119, 125, 124, 130, 130, 137] 0

k\_1000 485

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_5.sm case j12054\_5.sm

37 697.0240812301636 s [122, 156] 11.926605504587156 [0, 0, 0, 0, 7, 4, 7, 14, 10, 11, 5, 14, 14, 18, 17, 23, 17, 11, 30, 5, 24, 17, 18, 20, 24, 26, 23, 4, 20, 34, 34, 10, 30, 20, 62, 44, 54, 34, 17, 42, 7, 24, 26, 35, 19, 17, 56, 38, 47, 49, 24, 64, 34, 42, 34, 33, 56, 39, 58, 59, 57, 64, 65, 72, 26, 59, 67, 62, 40, 44, 39, 42, 64, 59, 72, 68, 71, 87, 52, 68, 71, 75, 96, 73, 81, 88, 81, 78, 57, 66, 87, 87, 78, 70, 90, 83, 51, 94, 96, 88, 78, 90, 103, 90, 87, 98, 96, 104, 88, 93, 91, 95, 101, 106, 108, 101, 109, 114, 104, 105, 115, 122] 0

k\_1000 486

opm 109

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_6.sm case j12054\_6.sm

39 700.3004031181335 s [120, 267] 10.091743119266056 [0, 0, 0, 0, 9, 9, 9, 12, 4, 12, 18, 20, 18, 31, 4, 33, 40, 21, 16, 22, 36, 12, 12, 31, 38, 35, 27, 21, 36, 37, 51, 44, 46, 18, 27, 25, 53, 35, 37, 31, 41, 36, 46, 65, 37, 48, 47, 14, 41, 41, 57, 58, 67, 48, 36, 27, 37, 42, 67, 71, 36, 63, 53, 76, 42, 54, 52, 84, 46, 70, 52, 84, 44, 57, 60, 60, 63, 72, 84, 52, 77, 60, 68, 80, 86, 71, 72, 84, 88, 79, 57, 81, 88, 82, 95, 75, 98, 88, 79, 85, 94, 85, 101, 84, 86, 93, 92, 90, 102, 101, 101, 98, 95, 106, 98, 106, 105, 110, 110, 112, 105, 120] 0

k\_1000 487

opm 111

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_7.sm case j12054\_7.sm

35 730.3340184688568 s [126, 155] 13.513513513513514 [0, 0, 0, 0, 6, 3, 12, 16, 6, 6, 39, 22, 2, 12, 7, 22, 9, 2, 16, 34, 11, 23, 9, 22, 27, 3, 26, 42, 11, 31, 16, 27, 45, 38, 19, 16, 18, 42, 24, 12, 23, 51, 51, 22, 37, 19, 54, 34, 34, 24, 50, 80, 50, 44, 57, 57, 73, 57, 31, 26, 58, 39, 94, 67, 55, 62, 66, 68, 45, 66, 45, 69, 36, 76, 42, 42, 60, 76, 61, 75, 84, 69, 68, 62, 84, 81, 73, 69, 79, 75, 88, 99, 90, 106, 75, 93, 81, 99, 108, 81, 72, 86, 85, 93, 90, 66, 103, 88, 102, 75, 98, 94, 103, 108, 111, 113, 118, 108, 122, 109, 109, 126] 0

k\_1000 488

opm 102

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_8.sm case j12054\_8.sm

36 724.0315022468567 s [112, 394] 9.803921568627452 [0, 0, 0, 0, 9, 9, 14, 9, 16, 16, 18, 23, 16, 17, 22, 23, 14, 23, 31, 31, 38, 19, 40, 25, 20, 14, 31, 10, 35, 25, 29, 25, 44, 29, 51, 6, 25, 7, 34, 47, 18, 36, 22, 44, 47, 54, 40, 6, 46, 37, 53, 29, 45, 44, 49, 48, 58, 59, 54, 48, 55, 61, 62, 65, 14, 50, 51, 78, 62, 69, 49, 69, 73, 32, 61, 34, 88, 66, 72, 89, 66, 72, 70, 70, 65, 77, 90, 79, 54, 79, 65, 97, 80, 88, 83, 80, 77, 72, 69, 83, 95, 76, 86, 81, 87, 89, 93, 97, 97, 82, 89, 97, 95, 95, 98, 97, 98, 98, 103, 108, 106, 112] 0

k\_1000 489

opm 107

the random choice case path in j120 ./rcpsp/j120.sm/j12054\_9.sm case j12054\_9.sm

34 732.8461427688599 s [120, 172] 12.149532710280374 [0, 0, 0, 0, 9, 5, 4, 4, 20, 13, 5, 8, 11, 18, 25, 19, 31, 25, 27, 22, 15, 13, 32, 22, 32, 20, 41, 9, 31, 11, 62, 49, 19, 36, 53, 29, 36, 24, 14, 20, 19, 31, 29, 42, 59, 37, 20, 65, 41, 48, 44, 68, 49, 44, 47, 34, 47, 84, 31, 52, 67, 36, 37, 53, 55, 70, 35, 77, 53, 86, 42, 52, 53, 59, 64, 54, 73, 62, 61, 82, 36, 42, 69, 63, 55, 72, 87, 67, 75, 76, 58, 65, 70, 77, 96, 73, 67, 91, 88, 77, 95, 87, 90, 68, 82, 98, 96, 105, 85, 92, 106, 91, 84, 113, 91, 105, 100, 107, 115, 108, 108, 120] 0

k\_1000 490

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_1.sm case j12055\_1.sm

46 727.9139938354492 s [107, 115] 7.000000000000001 [0, 0, 0, 0, 9, 3, 3, 4, 3, 9, 6, 17, 12, 12, 25, 20, 14, 11, 4, 7, 11, 34, 11, 22, 7, 25, 17, 25, 20, 29, 30, 12, 32, 21, 26, 31, 30, 22, 20, 39, 9, 41, 32, 40, 29, 42, 35, 43, 58, 16, 46, 50, 51, 49, 55, 21, 24, 14, 48, 39, 50, 41, 60, 51, 54, 22, 42, 62, 27, 61, 40, 46, 58, 60, 62, 60, 61, 61, 66, 61, 69, 66, 64, 55, 72, 72, 60, 78, 79, 66, 71, 58, 69, 61, 70, 75, 78, 82, 69, 82, 72, 69, 62, 79, 73, 68, 91, 78, 69, 81, 82, 89, 90, 89, 84, 84, 97, 91, 99, 100, 101, 107] 0

k\_1000 491

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_10.sm case j12055\_10.sm

44 716.8093709945679 s [108, 140] 8.0 [0, 0, 0, 0, 6, 6, 2, 9, 2, 4, 13, 13, 7, 11, 4, 8, 6, 14, 2, 20, 8, 15, 5, 21, 20, 7, 8, 9, 24, 21, 26, 38, 24, 8, 24, 13, 33, 26, 28, 24, 39, 23, 14, 39, 14, 44, 41, 39, 33, 31, 14, 33, 37, 35, 31, 50, 49, 14, 50, 48, 48, 56, 29, 26, 37, 21, 52, 14, 46, 42, 56, 56, 44, 41, 49, 70, 8, 35, 72, 63, 45, 59, 57, 50, 49, 49, 56, 75, 52, 63, 62, 54, 71, 66, 43, 59, 63, 65, 54, 76, 71, 66, 65, 61, 61, 72, 64, 76, 72, 74, 76, 81, 80, 79, 88, 89, 96, 84, 93, 72, 98, 108] 0

k\_1000 492

opm 83

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_2.sm case j12055\_2.sm

64 721.406929731369 s [86, 108] 3.614457831325301 [0, 0, 0, 0, 3, 3, 3, 7, 3, 6, 12, 3, 13, 6, 1, 12, 12, 18, 5, 11, 7, 6, 9, 14, 4, 19, 9, 6, 18, 15, 1, 18, 12, 23, 9, 15, 24, 13, 9, 16, 28, 21, 28, 13, 25, 28, 30, 12, 16, 25, 13, 9, 22, 29, 23, 16, 24, 45, 45, 28, 20, 28, 49, 24, 25, 28, 30, 26, 51, 26, 32, 33, 34, 43, 34, 29, 13, 22, 49, 31, 37, 30, 33, 39, 36, 48, 44, 42, 56, 30, 60, 40, 42, 38, 53, 40, 66, 59, 68, 42, 45, 52, 45, 52, 75, 40, 57, 64, 59, 70, 54, 77, 59, 60, 64, 75, 70, 77, 82, 71, 79, 86] 0

k\_1000 493

opm 126

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_3.sm case j12055\_3.sm

19 303.17226481437683 s [126, 176] 0.0 [0, 0, 0, 0, 5, 5, 14, 14, 14, 23, 31, 7, 40, 5, 40, 19, 25, 25, 12, 46, 27, 45, 32, 7, 40, 29, 52, 41, 3, 23, 54, 31, 49, 49, 45, 3, 37, 39, 42, 30, 39, 45, 37, 37, 30, 45, 45, 20, 27, 48, 51, 49, 61, 27, 56, 51, 51, 32, 56, 72, 23, 45, 17, 65, 58, 54, 48, 64, 52, 64, 68, 67, 48, 56, 72, 51, 64, 78, 77, 77, 65, 39, 71, 100, 62, 82, 80, 77, 67, 73, 84, 86, 80, 77, 78, 84, 68, 65, 93, 84, 94, 86, 92, 95, 99, 85, 99, 100, 95, 109, 92, 106, 106, 106, 103, 112, 108, 118, 120, 118, 108, 126] 0

k\_1000 494

opm 90

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_4.sm case j12055\_4.sm

53 717.766434431076 s [99, 241] 10.0 [0, 0, 0, 0, 3, 5, 5, 7, 10, 10, 3, 15, 8, 8, 5, 17, 16, 18, 18, 15, 19, 19, 8, 8, 29, 7, 26, 27, 36, 11, 12, 32, 11, 3, 29, 17, 29, 16, 26, 11, 17, 15, 26, 29, 32, 33, 39, 17, 31, 41, 38, 29, 40, 32, 41, 26, 39, 38, 35, 35, 39, 42, 47, 48, 37, 51, 42, 38, 42, 50, 35, 54, 43, 46, 38, 43, 58, 56, 47, 45, 33, 40, 64, 48, 54, 49, 58, 43, 39, 67, 69, 53, 61, 54, 60, 61, 64, 71, 61, 69, 45, 66, 70, 69, 74, 54, 79, 77, 73, 79, 79, 74, 78, 77, 80, 78, 79, 90, 97, 88, 80, 99] 0

k\_1000 495

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_5.sm case j12055\_5.sm

59 724.1623337268829 s [107, 161] 0.9433962264150944 [0, 0, 0, 0, 4, 10, 14, 4, 31, 2, 10, 16, 14, 7, 14, 23, 14, 24, 14, 18, 31, 28, 22, 7, 10, 14, 20, 21, 32, 16, 39, 32, 30, 18, 37, 43, 19, 21, 10, 39, 22, 49, 33, 39, 30, 32, 43, 37, 40, 37, 31, 48, 55, 42, 52, 30, 56, 66, 43, 40, 42, 48, 50, 51, 43, 47, 50, 42, 44, 55, 74, 50, 40, 55, 61, 52, 58, 57, 40, 48, 75, 67, 77, 67, 48, 37, 52, 53, 56, 56, 62, 67, 72, 77, 56, 62, 65, 68, 79, 77, 65, 58, 79, 59, 69, 65, 69, 83, 84, 71, 85, 82, 75, 81, 85, 86, 92, 79, 98, 83, 84, 107] 0

k\_1000 496

opm 100

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_6.sm case j12055\_6.sm

45 725.1189048290253 s [107, 114] 7.000000000000001 [0, 0, 0, 0, 4, 4, 3, 4, 8, 2, 13, 7, 10, 4, 8, 9, 12, 18, 18, 18, 21, 19, 51, 13, 14, 3, 24, 26, 31, 48, 18, 3, 17, 14, 31, 26, 21, 9, 31, 40, 43, 21, 23, 64, 48, 24, 26, 36, 25, 33, 27, 50, 51, 24, 45, 53, 36, 40, 33, 38, 48, 59, 33, 49, 51, 30, 58, 75, 36, 42, 36, 27, 67, 41, 59, 43, 53, 44, 58, 61, 45, 61, 63, 69, 58, 61, 61, 70, 78, 53, 51, 67, 69, 58, 76, 54, 70, 75, 77, 81, 79, 64, 69, 72, 79, 86, 81, 69, 80, 78, 83, 86, 83, 88, 95, 90, 99, 81, 74, 95, 104, 107] 0

k\_1000 497

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_7.sm case j12055\_7.sm

72 719.7913248538971 s [108, 148] 2.857142857142857 [0, 0, 0, 0, 7, 17, 8, 8, 8, 9, 16, 17, 17, 17, 20, 17, 9, 28, 28, 16, 24, 12, 24, 20, 25, 37, 25, 25, 13, 36, 7, 27, 21, 36, 36, 28, 31, 45, 17, 33, 39, 22, 39, 40, 33, 10, 12, 31, 42, 31, 33, 52, 19, 24, 47, 43, 43, 43, 36, 47, 44, 50, 33, 16, 42, 43, 51, 22, 52, 46, 50, 38, 52, 40, 62, 52, 66, 66, 68, 74, 51, 49, 71, 43, 74, 37, 55, 75, 44, 57, 75, 74, 59, 38, 53, 82, 46, 82, 91, 66, 44, 78, 57, 75, 79, 75, 64, 78, 82, 88, 83, 81, 84, 91, 82, 96, 84, 94, 98, 97, 91, 108] 0

k\_1000 498

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_8.sm case j12055\_8.sm

38 708.2277002334595 s [111, 119] 9.900990099009901 [0, 0, 0, 0, 1, 3, 4, 13, 16, 8, 15, 13, 13, 15, 3, 24, 11, 8, 8, 11, 4, 4, 32, 19, 23, 21, 13, 11, 17, 21, 21, 19, 23, 20, 24, 37, 20, 35, 12, 8, 26, 40, 23, 53, 10, 24, 40, 46, 21, 31, 10, 32, 24, 29, 40, 29, 31, 38, 36, 35, 34, 58, 38, 44, 38, 45, 50, 45, 50, 50, 44, 54, 47, 62, 43, 30, 47, 60, 53, 53, 49, 55, 53, 60, 55, 55, 58, 50, 75, 69, 62, 60, 84, 45, 70, 65, 73, 80, 66, 64, 84, 55, 66, 70, 80, 74, 87, 93, 76, 69, 80, 80, 85, 98, 100, 74, 94, 93, 62, 79, 102, 111] 0

k\_1000 499

opm 94

the random choice case path in j120 ./rcpsp/j120.sm/j12055\_9.sm case j12055\_9.sm

58 716.1683835983276 s [100, 153] 6.382978723404255 [0, 0, 0, 0, 1, 1, 3, 1, 5, 9, 9, 9, 5, 10, 9, 14, 7, 21, 25, 3, 5, 3, 10, 18, 18, 26, 34, 40, 26, 4, 20, 26, 10, 22, 29, 12, 21, 31, 29, 36, 38, 19, 25, 19, 28, 29, 31, 34, 26, 38, 44, 9, 20, 21, 24, 45, 31, 35, 29, 32, 20, 53, 49, 40, 48, 49, 59, 30, 48, 39, 42, 49, 50, 54, 50, 61, 63, 60, 68, 61, 65, 48, 35, 45, 55, 65, 54, 49, 44, 48, 60, 51, 59, 61, 60, 59, 69, 70, 43, 63, 58, 76, 70, 62, 69, 76, 63, 63, 62, 78, 80, 63, 61, 74, 70, 87, 93, 83, 76, 97, 91, 100] 0

k\_1000 500

opm 236

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_1.sm case j12056\_1.sm

11 1527.5376348495483 s [280, 1160] 18.64406779661017 [0, 41, 0, 0, 10, 2, 10, 48, 15, 18, 50, 53, 11, 54, 57, 30, 17, 48, 55, 50, 18, 23, 79, 29, 9, 58, 79, 66, 23, 29, 75, 71, 56, 146, 129, 14, 136, 115, 81, 70, 61, 71, 67, 85, 61, 97, 73, 90, 135, 139, 40, 86, 94, 98, 107, 122, 97, 31, 115, 176, 136, 125, 106, 129, 125, 148, 154, 201, 51, 154, 185, 143, 155, 160, 221, 85, 127, 201, 185, 68, 160, 166, 234, 225, 235, 192, 152, 252, 235, 170, 241, 178, 107, 216, 208, 192, 202, 255, 208, 218, 233, 169, 211, 229, 257, 247, 247, 196, 208, 256, 264, 162, 264, 255, 244, 256, 274, 269, 262, 275, 262, 280] 0

k\_1000 501

opm 258

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_10.sm case j12056\_10.sm

11 2236.213633775711 s [301, 2447] 16.666666666666664 [0, 9, 0, 0, 11, 9, 18, 14, 71, 47, 13, 25, 41, 87, 88, 19, 58, 92, 80, 23, 94, 13, 88, 123, 131, 151, 14, 69, 32, 60, 99, 155, 84, 120, 20, 41, 159, 87, 32, 77, 48, 160, 108, 142, 84, 77, 24, 52, 61, 110, 131, 128, 136, 177, 19, 173, 96, 100, 52, 191, 62, 191, 38, 198, 101, 114, 169, 57, 202, 177, 52, 198, 217, 176, 221, 221, 181, 137, 114, 176, 182, 136, 142, 182, 151, 147, 169, 200, 237, 208, 202, 239, 238, 214, 190, 246, 229, 212, 253, 270, 246, 252, 256, 147, 258, 271, 228, 261, 267, 226, 276, 223, 261, 283, 276, 293, 256, 279, 266, 285, 295, 301] 0

k\_1000 502

opm 204

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_2.sm case j12056\_2.sm

11 907.6577470302582 s [237, 329] 16.176470588235293 [0, 0, 12, 0, 7, 15, 18, 21, 48, 8, 20, 54, 41, 22, 22, 21, 63, 28, 37, 25, 12, 34, 34, 15, 49, 67, 35, 42, 54, 48, 59, 73, 67, 75, 67, 35, 94, 81, 74, 103, 89, 27, 87, 84, 59, 94, 113, 119, 80, 125, 102, 42, 125, 106, 75, 126, 121, 128, 89, 135, 84, 131, 138, 144, 90, 155, 149, 162, 136, 92, 121, 144, 117, 159, 167, 108, 118, 171, 156, 146, 103, 191, 162, 160, 106, 168, 86, 180, 177, 165, 168, 178, 191, 171, 198, 179, 213, 174, 178, 189, 181, 177, 127, 222, 191, 201, 213, 198, 185, 224, 208, 205, 217, 223, 168, 224, 210, 229, 215, 234, 210, 237] 0

k\_1000 503

opm 240

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_3.sm case j12056\_3.sm

11 915.8051247596741 s [269, 341] 12.083333333333334 [0, 14, 0, 10, 92, 34, 105, 41, 1, 10, 24, 73, 57, 34, 57, 35, 65, 118, 83, 20, 47, 10, 24, 1, 47, 72, 20, 41, 77, 47, 57, 83, 63, 32, 77, 33, 112, 65, 98, 101, 89, 111, 89, 72, 127, 83, 105, 129, 146, 122, 56, 107, 65, 135, 153, 139, 129, 140, 154, 153, 159, 163, 105, 163, 112, 122, 118, 145, 132, 181, 189, 211, 155, 161, 142, 159, 172, 152, 169, 196, 180, 169, 176, 216, 132, 204, 193, 219, 236, 163, 176, 221, 226, 219, 189, 152, 226, 176, 204, 193, 229, 236, 211, 211, 178, 250, 229, 247, 212, 244, 212, 256, 192, 239, 244, 242, 247, 249, 259, 260, 250, 269] 0

k\_1000 504

opm 222

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_4.sm case j12056\_4.sm

11 1077.0746190547943 s [250, 296] 12.612612612612612 [0, 0, 11, 0, 40, 37, 17, 6, 9, 37, 9, 25, 8, 81, 27, 16, 28, 42, 50, 53, 71, 56, 74, 25, 45, 45, 17, 94, 101, 94, 61, 104, 100, 118, 71, 99, 50, 106, 101, 56, 67, 27, 64, 64, 57, 79, 97, 115, 128, 92, 110, 122, 125, 62, 144, 66, 160, 144, 87, 138, 108, 138, 130, 161, 129, 122, 127, 161, 69, 150, 147, 202, 130, 86, 128, 68, 115, 156, 190, 177, 164, 178, 169, 152, 170, 161, 192, 210, 182, 219, 150, 150, 185, 181, 169, 223, 231, 198, 155, 204, 205, 179, 222, 231, 202, 204, 233, 185, 206, 207, 217, 221, 233, 237, 197, 233, 245, 240, 239, 249, 223, 250] 0

k\_1000 505

opm 280

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_5.sm case j12056\_5.sm

11 1680.4867403507233 s [315, 367] 12.5 [0, 8, 0, 0, 44, 18, 18, 8, 79, 24, 34, 40, 28, 57, 59, 6, 67, 21, 84, 107, 38, 33, 51, 38, 88, 83, 89, 122, 50, 88, 20, 99, 43, 55, 24, 50, 69, 34, 125, 57, 151, 49, 96, 157, 23, 43, 75, 117, 147, 136, 107, 125, 127, 104, 142, 147, 147, 156, 89, 128, 128, 76, 156, 142, 157, 127, 176, 167, 206, 138, 196, 176, 218, 97, 186, 206, 117, 177, 211, 211, 223, 186, 225, 110, 167, 200, 229, 237, 231, 245, 252, 231, 245, 213, 196, 265, 225, 260, 272, 229, 275, 266, 239, 186, 281, 281, 281, 270, 277, 218, 287, 237, 291, 293, 291, 297, 255, 302, 302, 298, 310, 315] 0

k\_1000 506

opm 214

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_6.sm case j12056\_6.sm

11 823.7959430217743 s [246, 278] 14.953271028037381 [0, 0, 0, 2, 17, 2, 12, 23, 82, 31, 9, 29, 32, 55, 66, 22, 111, 52, 13, 12, 57, 65, 52, 61, 32, 160, 13, 87, 76, 66, 64, 58, 26, 80, 118, 196, 95, 35, 40, 45, 128, 100, 40, 101, 72, 68, 83, 113, 110, 46, 133, 118, 155, 46, 92, 222, 94, 105, 35, 111, 124, 120, 48, 86, 57, 72, 102, 102, 184, 154, 156, 87, 170, 126, 173, 89, 133, 140, 214, 124, 116, 192, 140, 176, 122, 150, 178, 170, 147, 180, 202, 170, 157, 176, 161, 180, 137, 229, 190, 211, 201, 179, 199, 199, 154, 207, 161, 217, 211, 232, 202, 188, 207, 226, 238, 222, 210, 231, 239, 217, 236, 246] 0

k\_1000 507

opm 282

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_7.sm case j12056\_7.sm

11 1619.8684284687042 s [325, 367] 15.24822695035461 [0, 0, 0, 4, 18, 2, 22, 32, 13, 21, 24, 13, 9, 41, 53, 43, 57, 53, 36, 32, 47, 93, 67, 130, 114, 64, 57, 103, 109, 92, 71, 114, 85, 139, 123, 103, 155, 64, 82, 155, 107, 110, 123, 164, 92, 136, 139, 182, 146, 174, 177, 174, 182, 146, 45, 155, 78, 73, 41, 48, 130, 99, 126, 96, 165, 164, 186, 210, 165, 200, 187, 196, 171, 205, 107, 224, 192, 221, 214, 220, 119, 194, 230, 191, 255, 265, 205, 279, 231, 233, 202, 269, 229, 239, 249, 239, 254, 269, 265, 259, 254, 270, 249, 280, 259, 246, 290, 289, 283, 290, 299, 261, 300, 297, 308, 300, 304, 318, 317, 314, 321, 325] 0

k\_1000 508

opm 288

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_8.sm case j12056\_8.sm

11 2022.5186185836792 s [321, 338] 11.458333333333332 [0, 0, 0, 8, 9, 8, 16, 30, 15, 16, 26, 46, 37, 19, 26, 175, 17, 66, 73, 19, 54, 35, 113, 80, 37, 45, 45, 85, 91, 61, 73, 29, 51, 118, 145, 79, 56, 161, 81, 228, 88, 105, 103, 46, 98, 97, 112, 106, 147, 51, 30, 141, 182, 133, 135, 73, 150, 90, 155, 98, 128, 166, 136, 29, 203, 119, 135, 218, 93, 108, 210, 128, 220, 150, 131, 113, 150, 210, 143, 79, 158, 158, 189, 181, 167, 236, 167, 161, 177, 231, 218, 195, 248, 106, 253, 276, 242, 228, 195, 276, 238, 191, 207, 263, 246, 204, 136, 253, 263, 282, 298, 298, 270, 266, 281, 310, 289, 288, 306, 316, 306, 321] 0

k\_1000 509

opm 287

the random choice case path in j120 ./rcpsp/j120.sm/j12056\_9.sm case j12056\_9.sm

11 1748.9311828613281 s [339, 697] 18.118466898954704 [0, 0, 0, 0, 4, 8, 8, 18, 25, 45, 6, 33, 2, 210, 35, 87, 6, 51, 182, 95, 45, 65, 59, 146, 71, 113, 50, 165, 157, 97, 61, 91, 65, 129, 108, 67, 51, 82, 72, 33, 6, 88, 77, 102, 99, 138, 146, 82, 91, 112, 21, 186, 18, 77, 122, 98, 229, 122, 155, 122, 160, 238, 105, 109, 195, 136, 244, 223, 149, 175, 155, 196, 218, 218, 198, 147, 202, 125, 227, 234, 278, 251, 186, 227, 303, 129, 175, 262, 236, 244, 252, 203, 272, 245, 252, 175, 289, 165, 278, 262, 300, 285, 272, 290, 256, 281, 298, 289, 290, 319, 309, 315, 209, 324, 311, 319, 323, 248, 331, 323, 329, 339] 0

k\_1000 510

opm 185

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_1.sm case j12057\_1.sm

15 744.0242142677307 s [214, 224] 15.675675675675677 [0, 0, 0, 0, 17, 13, 5, 6, 15, 35, 43, 43, 13, 5, 10, 23, 14, 44, 51, 51, 36, 36, 26, 55, 44, 57, 26, 30, 18, 30, 37, 62, 36, 51, 76, 15, 54, 56, 86, 46, 80, 66, 86, 61, 71, 68, 94, 69, 55, 79, 89, 23, 29, 76, 36, 116, 46, 87, 93, 121, 104, 106, 111, 54, 66, 104, 126, 130, 96, 106, 120, 135, 132, 127, 120, 104, 127, 102, 142, 74, 111, 143, 145, 122, 152, 136, 136, 154, 157, 125, 143, 137, 165, 157, 136, 168, 176, 165, 168, 143, 160, 148, 179, 152, 174, 174, 175, 184, 180, 189, 188, 180, 169, 186, 191, 191, 199, 201, 194, 198, 209, 214] 0

k\_1000 511

opm 167

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_10.sm case j12057\_10.sm

17 719.5801935195923 s [194, 266] 16.16766467065868 [0, 0, 0, 0, 6, 22, 11, 28, 4, 19, 34, 11, 44, 9, 47, 36, 15, 48, 20, 21, 21, 51, 6, 37, 61, 39, 19, 30, 57, 28, 36, 9, 42, 56, 65, 59, 65, 61, 29, 62, 71, 57, 87, 38, 89, 79, 73, 93, 87, 76, 79, 36, 94, 59, 81, 105, 93, 100, 85, 100, 92, 94, 94, 66, 102, 104, 102, 96, 104, 104, 110, 109, 106, 112, 98, 111, 108, 118, 129, 126, 106, 117, 137, 118, 144, 125, 129, 133, 150, 119, 123, 121, 160, 140, 150, 145, 144, 154, 154, 137, 123, 134, 162, 149, 143, 165, 165, 171, 165, 175, 157, 170, 177, 179, 151, 157, 179, 172, 180, 186, 161, 194] 0

k\_1000 512

opm 161

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_2.sm case j12057\_2.sm

16 757.9268536567688 s [182, 559] 13.043478260869565 [0, 17, 0, 0, 4, 7, 8, 4, 13, 15, 9, 15, 24, 24, 24, 15, 12, 32, 9, 26, 12, 13, 11, 32, 43, 44, 43, 57, 51, 42, 49, 33, 59, 26, 51, 60, 22, 60, 25, 63, 67, 67, 38, 27, 29, 68, 68, 35, 77, 65, 78, 38, 68, 81, 74, 53, 24, 48, 82, 84, 95, 92, 82, 87, 67, 91, 103, 98, 96, 96, 106, 99, 120, 109, 103, 105, 108, 109, 124, 118, 131, 123, 112, 117, 124, 124, 124, 112, 123, 128, 139, 144, 143, 131, 140, 143, 144, 133, 149, 156, 148, 140, 129, 139, 138, 146, 150, 152, 161, 149, 161, 126, 156, 162, 146, 159, 167, 171, 165, 180, 164, 182] 0

k\_1000 513

opm 184

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_3.sm case j12057\_3.sm

13 723.5840382575989 s [209, 220] 13.586956521739129 [0, 0, 0, 0, 10, 5, 19, 47, 10, 1, 17, 14, 26, 14, 40, 1, 22, 14, 23, 27, 24, 57, 45, 32, 37, 51, 55, 37, 136, 57, 59, 93, 78, 84, 63, 69, 61, 106, 91, 55, 91, 68, 42, 122, 34, 100, 33, 105, 117, 133, 69, 96, 100, 134, 111, 112, 43, 146, 112, 67, 127, 33, 76, 164, 49, 87, 111, 136, 146, 87, 108, 56, 118, 173, 73, 98, 77, 147, 59, 180, 98, 136, 116, 124, 153, 77, 139, 157, 153, 116, 130, 138, 84, 144, 168, 149, 160, 124, 134, 168, 146, 154, 150, 173, 163, 152, 164, 173, 174, 184, 159, 188, 168, 184, 163, 180, 192, 174, 184, 185, 200, 209] 0

k\_1000 514

opm 199

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_4.sm case j12057\_4.sm

13 782.7936692237854 s [226, 539] 13.5678391959799 [0, 15, 0, 0, 23, 31, 31, 7, 11, 32, 13, 47, 11, 32, 13, 42, 9, 31, 43, 33, 80, 51, 7, 40, 47, 96, 62, 9, 132, 59, 94, 72, 19, 104, 62, 40, 50, 72, 113, 119, 96, 42, 56, 82, 89, 75, 75, 131, 96, 100, 72, 23, 80, 66, 104, 91, 66, 103, 21, 112, 50, 126, 108, 110, 122, 55, 87, 133, 138, 112, 137, 123, 160, 122, 139, 150, 119, 140, 141, 137, 87, 170, 152, 129, 149, 188, 142, 164, 147, 198, 141, 156, 142, 166, 174, 169, 183, 150, 159, 94, 174, 156, 147, 206, 167, 178, 165, 183, 191, 200, 190, 199, 191, 201, 182, 169, 210, 214, 193, 220, 216, 226] 0

k\_1000 515

opm 179

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_5.sm case j12057\_5.sm

14 719.5554351806641 s [203, 213] 13.40782122905028 [0, 0, 0, 0, 2, 17, 6, 7, 10, 10, 10, 20, 24, 28, 26, 32, 23, 20, 13, 38, 40, 40, 41, 28, 35, 37, 52, 37, 15, 53, 50, 63, 20, 47, 72, 65, 56, 47, 76, 45, 83, 60, 72, 55, 63, 81, 83, 81, 86, 99, 97, 101, 74, 119, 128, 135, 89, 73, 103, 87, 23, 138, 145, 103, 84, 113, 107, 65, 92, 143, 149, 87, 121, 96, 109, 128, 111, 109, 156, 113, 103, 106, 156, 107, 131, 117, 128, 135, 159, 122, 152, 117, 128, 125, 153, 145, 124, 130, 166, 117, 146, 160, 136, 160, 143, 166, 174, 178, 166, 170, 177, 178, 152, 178, 169, 183, 181, 160, 190, 193, 144, 203] 0

k\_1000 516

opm 188

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_6.sm case j12057\_6.sm

11 859.4277191162109 s [218, 260] 15.957446808510639 [0, 0, 0, 0, 5, 13, 13, 2, 13, 17, 10, 17, 43, 53, 26, 73, 6, 7, 26, 56, 32, 33, 71, 56, 32, 32, 29, 62, 43, 37, 72, 69, 61, 29, 93, 37, 16, 83, 89, 31, 85, 87, 89, 22, 39, 74, 46, 97, 51, 83, 63, 77, 88, 72, 97, 95, 98, 105, 79, 98, 107, 124, 114, 117, 65, 133, 105, 119, 127, 106, 137, 111, 126, 119, 141, 144, 149, 135, 138, 154, 128, 128, 93, 124, 157, 166, 152, 147, 128, 158, 167, 137, 168, 162, 173, 157, 170, 172, 141, 179, 126, 173, 182, 178, 192, 192, 179, 193, 192, 171, 198, 182, 201, 186, 193, 205, 199, 215, 217, 208, 208, 218] 0

k\_1000 517

opm 166

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_7.sm case j12057\_7.sm

15 760.909022808075 s [190, 308] 14.457831325301203 [0, 0, 0, 0, 6, 12, 12, 7, 17, 12, 10, 1, 35, 19, 22, 31, 20, 57, 26, 12, 31, 26, 31, 35, 5, 43, 48, 52, 22, 45, 42, 26, 43, 51, 35, 52, 41, 34, 64, 79, 43, 42, 58, 48, 70, 79, 83, 62, 62, 116, 89, 130, 106, 76, 113, 86, 99, 77, 93, 86, 63, 98, 52, 58, 97, 73, 66, 81, 93, 107, 99, 101, 112, 98, 83, 63, 121, 112, 98, 130, 121, 126, 157, 124, 126, 113, 143, 132, 148, 119, 117, 155, 140, 121, 130, 152, 104, 143, 140, 161, 173, 151, 135, 161, 92, 158, 136, 167, 150, 132, 155, 170, 176, 165, 155, 175, 175, 182, 182, 185, 184, 190] 0

k\_1000 518

opm 162

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_8.sm case j12057\_8.sm

11 747.6678040027618 s [183, 2003] 12.962962962962962 [0, 0, 0, 0, 4, 7, 7, 20, 23, 26, 8, 2, 27, 18, 21, 16, 11, 28, 2, 14, 26, 28, 34, 23, 29, 35, 25, 42, 39, 57, 48, 59, 58, 36, 47, 53, 39, 52, 42, 63, 69, 73, 63, 70, 84, 70, 99, 87, 113, 58, 77, 44, 78, 77, 139, 107, 94, 99, 57, 43, 77, 83, 120, 69, 103, 117, 60, 47, 78, 83, 56, 84, 99, 59, 83, 112, 130, 87, 91, 119, 94, 135, 127, 96, 145, 89, 106, 122, 145, 122, 112, 148, 128, 143, 131, 143, 154, 91, 133, 140, 156, 114, 146, 142, 150, 156, 103, 148, 164, 135, 153, 133, 154, 158, 166, 164, 167, 171, 164, 171, 174, 183] 0

k\_1000 519

opm 167

the random choice case path in j120 ./rcpsp/j120.sm/j12057\_9.sm case j12057\_9.sm

13 703.9392912387848 s [201, 1432] 20.35928143712575 [0, 0, 32, 0, 8, 8, 8, 3, 14, 26, 36, 3, 10, 18, 22, 38, 10, 50, 26, 11, 42, 56, 33, 26, 44, 27, 54, 16, 66, 54, 11, 36, 33, 40, 47, 42, 66, 43, 20, 76, 87, 57, 7, 73, 77, 102, 69, 58, 94, 80, 42, 7, 57, 105, 64, 100, 111, 110, 118, 69, 86, 119, 106, 77, 95, 116, 94, 80, 135, 88, 103, 137, 107, 100, 125, 109, 137, 95, 126, 144, 136, 106, 111, 136, 153, 114, 127, 169, 146, 140, 147, 154, 155, 160, 118, 160, 163, 165, 129, 175, 87, 167, 141, 175, 144, 174, 175, 149, 147, 155, 167, 175, 165, 183, 182, 183, 186, 187, 175, 160, 197, 201] 0

k\_1000 520

opm 141

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_1.sm case j12058\_1.sm

22 721.5113842487335 s [157, 177] 11.347517730496454 [0, 0, 0, 0, 9, 6, 9, 18, 25, 6, 24, 18, 6, 22, 25, 5, 30, 75, 51, 1, 12, 48, 26, 23, 17, 26, 31, 9, 62, 30, 23, 33, 55, 17, 36, 30, 44, 34, 52, 56, 38, 59, 42, 90, 37, 62, 38, 63, 66, 66, 31, 50, 56, 57, 87, 83, 52, 73, 72, 81, 32, 87, 61, 83, 110, 92, 69, 87, 93, 73, 89, 84, 93, 102, 59, 59, 96, 81, 85, 106, 105, 42, 91, 102, 96, 110, 110, 101, 102, 102, 115, 120, 127, 128, 51, 107, 119, 112, 112, 132, 120, 120, 129, 115, 129, 141, 124, 136, 112, 122, 133, 116, 135, 145, 148, 124, 138, 141, 145, 155, 150, 157] 0

k\_1000 521

opm 131

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_10.sm case j12058\_10.sm

20 698.2276973724365 s [149, 177] 13.740458015267176 [0, 0, 0, 0, 2, 7, 7, 15, 22, 13, 13, 9, 32, 16, 25, 22, 10, 26, 22, 40, 17, 28, 58, 33, 26, 30, 17, 46, 40, 17, 15, 49, 54, 48, 59, 34, 57, 40, 19, 37, 7, 46, 49, 55, 44, 53, 39, 62, 55, 40, 50, 75, 49, 75, 59, 66, 66, 67, 51, 68, 83, 81, 30, 51, 58, 78, 89, 115, 89, 79, 74, 94, 93, 101, 59, 28, 48, 108, 88, 102, 59, 100, 79, 71, 84, 103, 67, 94, 92, 67, 111, 88, 108, 112, 116, 119, 83, 119, 97, 115, 123, 127, 100, 129, 101, 130, 114, 128, 117, 140, 140, 123, 119, 105, 130, 133, 143, 141, 144, 140, 144, 149] 0

k\_1000 522

opm 126

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_2.sm case j12058\_2.sm

30 736.0909855365753 s [146, 196] 15.873015873015872 [0, 0, 0, 0, 7, 5, 8, 5, 5, 15, 18, 14, 16, 26, 26, 44, 41, 27, 36, 25, 22, 14, 23, 59, 51, 49, 7, 29, 59, 53, 1, 18, 22, 29, 30, 20, 31, 19, 36, 32, 23, 33, 19, 37, 34, 54, 43, 38, 69, 68, 84, 60, 66, 38, 45, 53, 66, 86, 23, 84, 98, 72, 45, 92, 52, 75, 33, 51, 31, 112, 58, 76, 101, 90, 103, 102, 76, 127, 102, 55, 79, 64, 105, 43, 81, 67, 78, 90, 115, 75, 88, 100, 93, 105, 69, 84, 107, 112, 33, 122, 112, 91, 84, 114, 130, 113, 121, 113, 105, 128, 132, 113, 118, 114, 117, 118, 124, 133, 139, 133, 135, 146] 0

k\_1000 523

opm 120

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_3.sm case j12058\_3.sm

31 708.8626849651337 s [127, 133] 5.833333333333333 [0, 0, 0, 0, 8, 10, 13, 10, 13, 20, 10, 22, 20, 28, 30, 30, 13, 15, 21, 20, 40, 24, 41, 50, 32, 8, 24, 32, 15, 33, 24, 13, 34, 32, 38, 40, 42, 51, 15, 47, 33, 44, 46, 58, 65, 49, 59, 55, 20, 68, 64, 1, 47, 22, 45, 73, 55, 50, 77, 73, 54, 68, 78, 80, 81, 59, 60, 67, 72, 87, 70, 61, 83, 77, 73, 60, 98, 92, 80, 90, 80, 92, 91, 76, 89, 98, 105, 66, 105, 92, 109, 80, 98, 97, 103, 108, 83, 73, 111, 107, 109, 76, 102, 112, 121, 114, 94, 92, 99, 107, 91, 118, 104, 97, 114, 110, 117, 121, 118, 119, 125, 127] 0

k\_1000 524

opm 145

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_4.sm case j12058\_4.sm

17 767.5986082553864 s [164, 209] 13.10344827586207 [0, 0, 0, 0, 9, 19, 33, 8, 5, 29, 28, 9, 2, 15, 22, 12, 2, 31, 71, 70, 25, 14, 38, 21, 20, 47, 23, 92, 44, 15, 53, 33, 45, 39, 33, 79, 55, 42, 76, 51, 35, 53, 62, 47, 41, 51, 39, 72, 65, 44, 85, 94, 79, 83, 74, 89, 74, 71, 61, 89, 99, 101, 15, 93, 65, 86, 33, 60, 101, 101, 71, 58, 75, 101, 105, 101, 84, 94, 105, 83, 111, 94, 112, 96, 97, 113, 116, 110, 121, 109, 111, 97, 116, 114, 123, 130, 123, 118, 125, 135, 105, 140, 133, 145, 126, 152, 146, 145, 153, 152, 123, 136, 140, 147, 154, 145, 158, 161, 150, 162, 162, 164] 0

k\_1000 525

opm 120

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_5.sm case j12058\_5.sm

26 692.6065626144409 s [133, 619] 10.833333333333334 [0, 0, 0, 0, 4, 4, 5, 5, 10, 5, 12, 4, 23, 45, 12, 19, 18, 64, 37, 18, 27, 19, 11, 36, 40, 32, 15, 20, 21, 20, 45, 14, 14, 19, 55, 28, 47, 40, 44, 36, 30, 36, 41, 12, 49, 46, 52, 37, 29, 47, 64, 58, 50, 53, 30, 23, 62, 50, 64, 46, 83, 82, 96, 72, 64, 96, 50, 51, 106, 56, 56, 71, 53, 73, 56, 90, 64, 59, 55, 91, 91, 74, 62, 71, 79, 66, 68, 80, 78, 77, 64, 86, 85, 85, 94, 86, 101, 88, 101, 68, 105, 94, 80, 109, 99, 76, 96, 99, 78, 119, 105, 90, 101, 109, 109, 116, 115, 114, 125, 117, 124, 133] 0

k\_1000 526

opm 140

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_6.sm case j12058\_6.sm

19 678.3621397018433 s [160, 1072] 14.285714285714285 [0, 0, 0, 0, 8, 7, 8, 9, 14, 24, 7, 11, 32, 14, 31, 8, 29, 36, 11, 38, 21, 18, 22, 11, 18, 32, 68, 36, 47, 24, 23, 27, 39, 29, 27, 45, 70, 29, 36, 40, 31, 80, 42, 51, 65, 18, 39, 54, 57, 47, 38, 9, 75, 101, 74, 56, 56, 35, 65, 59, 103, 68, 41, 97, 74, 82, 84, 25, 52, 73, 96, 103, 54, 44, 70, 65, 68, 55, 65, 105, 76, 115, 105, 94, 120, 89, 94, 74, 114, 84, 115, 122, 112, 142, 126, 97, 122, 122, 125, 114, 77, 135, 136, 132, 96, 85, 102, 97, 104, 101, 123, 119, 139, 142, 134, 134, 136, 146, 151, 151, 132, 160] 0

k\_1000 527

opm 147

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_7.sm case j12058\_7.sm

22 684.162846326828 s [162, 401] 10.204081632653061 [0, 0, 0, 0, 3, 8, 8, 14, 13, 9, 17, 8, 27, 18, 13, 20, 25, 14, 33, 33, 28, 30, 8, 37, 42, 37, 41, 8, 28, 51, 36, 21, 37, 42, 44, 35, 18, 47, 48, 22, 52, 37, 55, 61, 37, 60, 27, 45, 51, 69, 56, 32, 64, 62, 72, 53, 64, 60, 62, 77, 41, 56, 75, 83, 84, 53, 69, 77, 90, 72, 83, 75, 76, 86, 66, 77, 91, 86, 88, 98, 92, 92, 108, 100, 84, 85, 110, 110, 76, 101, 109, 113, 123, 128, 120, 101, 120, 100, 103, 129, 135, 135, 91, 122, 119, 119, 132, 133, 140, 141, 141, 143, 132, 143, 150, 141, 145, 145, 152, 154, 154, 162] 0

k\_1000 528

opm 132

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_8.sm case j12058\_8.sm

27 695.3289108276367 s [153, 179] 15.909090909090908 [0, 0, 0, 0, 3, 3, 8, 7, 3, 3, 9, 9, 11, 10, 15, 27, 33, 9, 16, 22, 30, 7, 21, 22, 13, 18, 30, 52, 30, 40, 21, 39, 13, 23, 63, 69, 23, 49, 45, 18, 7, 36, 58, 39, 14, 23, 31, 55, 22, 55, 49, 39, 40, 44, 77, 39, 29, 35, 68, 57, 58, 29, 87, 64, 97, 44, 84, 48, 57, 71, 89, 103, 74, 119, 58, 66, 71, 78, 68, 81, 87, 105, 93, 81, 94, 114, 76, 69, 105, 99, 74, 71, 111, 95, 106, 114, 97, 120, 120, 124, 94, 116, 88, 93, 115, 111, 131, 125, 115, 124, 126, 129, 136, 129, 125, 134, 120, 129, 145, 135, 134, 153] 0

k\_1000 529

opm 130

the random choice case path in j120 ./rcpsp/j120.sm/j12058\_9.sm case j12058\_9.sm

21 728.625883102417 s [146, 154] 12.307692307692308 [0, 0, 0, 0, 5, 2, 11, 14, 2, 11, 11, 20, 8, 14, 8, 18, 13, 20, 2, 17, 10, 15, 17, 22, 19, 23, 26, 11, 32, 22, 32, 30, 38, 51, 28, 39, 56, 34, 35, 42, 49, 66, 29, 25, 53, 45, 50, 48, 50, 41, 42, 63, 66, 61, 17, 69, 74, 45, 68, 59, 42, 75, 41, 61, 69, 58, 75, 79, 82, 76, 51, 80, 77, 86, 83, 80, 65, 90, 69, 88, 90, 81, 98, 90, 78, 92, 88, 105, 98, 115, 107, 119, 99, 122, 122, 109, 109, 122, 122, 90, 105, 114, 97, 115, 116, 126, 116, 119, 128, 131, 131, 133, 132, 140, 99, 127, 130, 128, 135, 133, 145, 146] 0

k\_1000 530

opm 114

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_1.sm case j12059\_1.sm

34 708.9546055793762 s [124, 140] 8.771929824561402 [0, 0, 0, 0, 5, 11, 21, 22, 21, 24, 31, 28, 24, 21, 5, 1, 7, 34, 1, 25, 34, 7, 22, 5, 34, 41, 5, 11, 32, 50, 22, 43, 39, 54, 43, 44, 22, 9, 56, 44, 32, 33, 22, 58, 26, 47, 33, 13, 5, 60, 65, 65, 37, 37, 33, 40, 40, 49, 59, 68, 30, 42, 49, 45, 58, 59, 62, 30, 50, 56, 65, 63, 50, 26, 52, 54, 75, 55, 60, 67, 39, 65, 58, 70, 66, 78, 60, 70, 72, 75, 79, 81, 76, 76, 75, 82, 94, 70, 81, 84, 89, 81, 92, 88, 95, 94, 80, 81, 90, 97, 100, 106, 100, 98, 107, 91, 102, 104, 97, 114, 115, 124] 0

k\_1000 531

opm 132

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_10.sm case j12059\_10.sm

27 721.5620291233063 s [144, 160] 9.090909090909092 [0, 0, 0, 0, 1, 4, 5, 1, 1, 10, 11, 8, 21, 16, 29, 29, 12, 26, 20, 14, 38, 33, 36, 20, 23, 66, 21, 58, 35, 40, 7, 20, 24, 29, 61, 45, 11, 11, 51, 57, 8, 66, 44, 34, 65, 25, 53, 10, 45, 42, 76, 71, 59, 26, 47, 84, 33, 40, 81, 75, 85, 78, 46, 49, 89, 83, 53, 91, 58, 64, 69, 77, 103, 65, 81, 85, 76, 106, 78, 94, 113, 83, 87, 87, 95, 101, 99, 111, 104, 96, 105, 116, 96, 107, 80, 126, 101, 105, 115, 113, 118, 125, 119, 126, 86, 124, 118, 134, 132, 111, 99, 128, 138, 132, 125, 128, 131, 137, 141, 139, 139, 144] 0

k\_1000 532

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_2.sm case j12059\_2.sm

32 710.771874666214 s [119, 144] 12.264150943396226 [0, 0, 0, 0, 5, 1, 1, 5, 5, 37, 7, 12, 24, 8, 16, 15, 23, 17, 11, 27, 7, 25, 16, 33, 27, 27, 46, 35, 34, 32, 23, 7, 16, 25, 8, 31, 34, 37, 55, 40, 35, 18, 36, 25, 9, 27, 32, 27, 43, 47, 55, 48, 47, 55, 46, 36, 46, 45, 35, 49, 52, 58, 52, 57, 54, 63, 58, 64, 65, 57, 59, 66, 43, 71, 72, 44, 60, 75, 67, 78, 65, 58, 85, 70, 74, 71, 58, 68, 77, 83, 81, 67, 81, 88, 72, 95, 95, 78, 97, 87, 78, 92, 75, 83, 83, 92, 95, 93, 104, 98, 90, 99, 79, 93, 109, 107, 108, 107, 112, 117, 113, 119] 0

k\_1000 533

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_3.sm case j12059\_3.sm

44 699.5847537517548 s [119, 133] 10.185185185185185 [0, 0, 0, 0, 10, 10, 10, 15, 7, 22, 10, 15, 14, 16, 32, 22, 22, 17, 16, 45, 50, 7, 25, 24, 24, 32, 53, 33, 39, 55, 17, 28, 30, 45, 55, 56, 52, 25, 37, 48, 56, 35, 32, 35, 38, 32, 38, 75, 32, 41, 39, 64, 49, 33, 2, 64, 84, 70, 24, 40, 62, 46, 52, 39, 52, 40, 80, 63, 83, 49, 70, 59, 90, 48, 65, 39, 57, 57, 78, 51, 78, 84, 87, 70, 60, 85, 44, 60, 73, 55, 64, 65, 77, 72, 85, 71, 92, 81, 81, 78, 62, 90, 75, 88, 97, 96, 85, 90, 96, 100, 98, 92, 91, 101, 98, 100, 108, 109, 100, 111, 116, 119] 0

k\_1000 534

opm 108

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_4.sm case j12059\_4.sm

32 717.8101687431335 s [116, 158] 7.4074074074074066 [0, 0, 0, 0, 2, 4, 4, 9, 15, 11, 15, 4, 24, 12, 11, 21, 22, 21, 33, 50, 31, 2, 37, 27, 21, 4, 28, 44, 21, 42, 45, 12, 19, 38, 12, 30, 51, 39, 31, 46, 23, 39, 42, 12, 48, 23, 30, 45, 44, 49, 37, 24, 58, 37, 51, 51, 51, 52, 16, 59, 53, 55, 55, 63, 58, 62, 29, 44, 56, 63, 66, 58, 37, 59, 57, 54, 63, 72, 63, 66, 67, 68, 76, 60, 64, 61, 64, 75, 86, 74, 72, 76, 79, 73, 85, 77, 82, 81, 85, 89, 87, 85, 88, 95, 81, 89, 89, 93, 99, 46, 80, 99, 93, 103, 87, 102, 104, 106, 108, 107, 104, 116] 0

k\_1000 535

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_5.sm case j12059\_5.sm

34 709.9588341712952 s [111, 1061] 4.716981132075472 [0, 0, 0, 0, 4, 4, 5, 6, 11, 5, 11, 12, 12, 11, 11, 11, 15, 35, 15, 29, 21, 19, 13, 6, 16, 26, 16, 53, 35, 8, 46, 19, 35, 19, 23, 4, 36, 35, 85, 45, 39, 53, 24, 29, 19, 30, 45, 20, 53, 57, 34, 29, 54, 59, 36, 40, 49, 45, 47, 68, 52, 42, 37, 81, 71, 35, 78, 61, 60, 52, 26, 63, 45, 66, 52, 33, 49, 51, 53, 43, 72, 49, 77, 68, 62, 64, 71, 90, 68, 64, 73, 62, 57, 66, 74, 77, 88, 92, 87, 82, 72, 89, 71, 82, 79, 83, 79, 67, 80, 87, 85, 87, 91, 93, 95, 92, 96, 98, 102, 102, 97, 111] 0

k\_1000 536

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_6.sm case j12059\_6.sm

31 713.7847104072571 s [129, 169] 12.173913043478262 [0, 0, 0, 0, 10, 7, 11, 5, 7, 5, 16, 11, 18, 10, 7, 23, 12, 24, 19, 25, 5, 12, 22, 27, 29, 48, 14, 37, 30, 51, 15, 38, 51, 36, 26, 45, 18, 34, 26, 19, 39, 22, 28, 44, 37, 19, 38, 27, 35, 60, 36, 50, 52, 42, 44, 44, 61, 54, 64, 40, 47, 54, 64, 48, 58, 62, 58, 61, 68, 60, 71, 62, 54, 72, 80, 60, 72, 82, 92, 72, 80, 74, 72, 76, 67, 84, 91, 94, 80, 73, 87, 71, 88, 82, 91, 100, 110, 73, 66, 104, 65, 98, 83, 88, 94, 96, 82, 119, 113, 89, 99, 101, 110, 105, 112, 111, 117, 94, 126, 122, 123, 129] 0

k\_1000 537

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_7.sm case j12059\_7.sm

34 726.9802370071411 s [124, 294] 10.714285714285714 [0, 0, 0, 0, 9, 22, 9, 2, 11, 7, 17, 2, 10, 11, 14, 17, 8, 19, 31, 15, 26, 18, 15, 24, 46, 26, 26, 37, 7, 30, 36, 52, 56, 42, 42, 36, 48, 10, 27, 45, 27, 39, 52, 58, 11, 30, 48, 40, 56, 63, 67, 17, 53, 45, 63, 57, 62, 48, 68, 66, 36, 73, 61, 53, 64, 74, 36, 75, 66, 68, 70, 61, 57, 70, 70, 80, 71, 79, 83, 71, 81, 84, 85, 74, 90, 99, 81, 101, 98, 97, 87, 98, 91, 94, 92, 105, 113, 103, 107, 85, 101, 84, 100, 82, 100, 87, 103, 99, 110, 93, 105, 106, 108, 110, 108, 115, 109, 118, 116, 119, 119, 124] 0

k\_1000 538

opm 110

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_8.sm case j12059\_8.sm

30 723.5308065414429 s [120, 172] 9.090909090909092 [0, 0, 0, 0, 5, 8, 8, 8, 8, 12, 23, 23, 12, 5, 12, 17, 32, 29, 20, 35, 33, 22, 75, 25, 32, 25, 34, 35, 12, 36, 19, 13, 85, 25, 2, 45, 56, 44, 21, 43, 49, 36, 13, 61, 41, 29, 65, 72, 73, 51, 56, 49, 49, 65, 46, 71, 2, 62, 32, 41, 78, 44, 56, 56, 88, 73, 71, 91, 71, 50, 85, 72, 49, 61, 80, 58, 96, 64, 83, 99, 89, 90, 72, 58, 53, 64, 80, 86, 97, 90, 95, 73, 86, 104, 93, 104, 105, 82, 60, 79, 92, 98, 100, 100, 101, 98, 99, 104, 102, 108, 106, 111, 113, 104, 106, 107, 111, 115, 117, 116, 112, 120] 0

k\_1000 539

opm 119

the random choice case path in j120 ./rcpsp/j120.sm/j12059\_9.sm case j12059\_9.sm

33 710.6657726764679 s [136, 153] 14.285714285714285 [0, 0, 0, 0, 6, 6, 6, 12, 19, 12, 19, 18, 23, 16, 6, 16, 46, 15, 25, 18, 32, 49, 40, 40, 27, 34, 40, 34, 17, 25, 26, 1, 32, 32, 47, 32, 42, 42, 56, 49, 6, 51, 51, 53, 43, 31, 33, 64, 51, 26, 56, 65, 58, 67, 59, 41, 63, 58, 61, 58, 64, 77, 74, 67, 49, 72, 9, 74, 66, 38, 57, 62, 67, 81, 72, 76, 78, 85, 84, 95, 70, 60, 77, 77, 95, 80, 90, 81, 27, 77, 73, 84, 84, 92, 80, 93, 91, 85, 97, 84, 88, 98, 98, 100, 103, 103, 108, 113, 100, 121, 105, 106, 114, 129, 101, 103, 110, 113, 130, 118, 124, 136] 0

k\_1000 540

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_1.sm case j1205\_1.sm

8 53.152583837509155 s [92, 116] 0.0 [0, 0, 0, 0, 7, 10, 14, 10, 13, 14, 8, 6, 13, 7, 14, 6, 12, 15, 16, 15, 19, 15, 22, 22, 24, 19, 15, 19, 22, 10, 22, 20, 18, 15, 26, 31, 13, 26, 28, 20, 7, 36, 23, 19, 26, 35, 28, 36, 6, 31, 37, 23, 31, 16, 16, 36, 41, 20, 31, 37, 23, 12, 30, 37, 39, 24, 40, 18, 29, 26, 34, 42, 15, 39, 34, 43, 51, 19, 50, 15, 29, 13, 32, 18, 42, 42, 39, 43, 28, 18, 43, 50, 42, 39, 51, 46, 42, 42, 42, 57, 21, 48, 51, 54, 21, 63, 73, 33, 75, 51, 43, 48, 64, 57, 57, 74, 66, 55, 58, 84, 67, 92] 0

k\_1000 541

opm 92

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_10.sm case j1205\_10.sm

0 4.405965328216553 s [92, 154] 0.0 [0, 0, 0, 0, 9, 9, 18, 18, 27, 12, 4, 13, 4, 18, 12, 16, 9, 14, 13, 22, 18, 24, 15, 26, 22, 22, 19, 13, 25, 26, 4, 24, 23, 16, 26, 19, 23, 30, 29, 40, 39, 29, 42, 25, 30, 26, 25, 26, 34, 39, 39, 18, 43, 42, 43, 30, 22, 30, 34, 34, 35, 39, 25, 33, 23, 37, 36, 40, 22, 12, 16, 48, 33, 27, 49, 45, 16, 12, 43, 53, 51, 53, 27, 25, 46, 37, 49, 30, 57, 52, 30, 62, 23, 56, 57, 30, 30, 58, 36, 38, 29, 52, 25, 56, 36, 61, 63, 61, 40, 40, 66, 69, 72, 66, 70, 59, 78, 36, 69, 88, 78, 92] 0

k\_1000 542

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_2.sm case j1205\_2.sm

7 41.75688934326172 s [80, 86] 0.0 [0, 0, 0, 0, 2, 9, 2, 9, 10, 16, 9, 3, 11, 10, 3, 4, 4, 8, 10, 14, 10, 10, 10, 14, 3, 11, 13, 11, 19, 8, 19, 24, 24, 5, 18, 14, 13, 5, 25, 32, 29, 19, 19, 13, 13, 16, 14, 23, 27, 11, 19, 16, 19, 24, 32, 28, 20, 32, 22, 14, 34, 22, 30, 19, 41, 24, 11, 40, 37, 32, 16, 4, 27, 35, 40, 16, 27, 30, 22, 34, 18, 2, 20, 34, 41, 16, 37, 33, 25, 45, 37, 32, 40, 47, 34, 26, 41, 43, 48, 42, 52, 34, 16, 44, 53, 17, 49, 39, 35, 52, 63, 57, 49, 60, 35, 70, 45, 64, 73, 71, 63, 80] 0

k\_1000 543

opm 72

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_3.sm case j1205\_3.sm

39 392.76875376701355 s [72, 112] 0.0 [0, 0, 0, 0, 7, 5, 2, 5, 6, 6, 7, 6, 10, 5, 11, 16, 10, 12, 22, 15, 20, 17, 24, 20, 24, 16, 14, 16, 16, 31, 15, 25, 17, 11, 7, 32, 22, 24, 10, 17, 26, 25, 37, 16, 29, 23, 27, 24, 36, 15, 33, 30, 43, 32, 40, 33, 35, 45, 15, 32, 23, 39, 25, 2, 47, 25, 21, 12, 25, 31, 54, 12, 42, 27, 38, 24, 22, 38, 37, 12, 42, 27, 42, 32, 36, 16, 26, 42, 27, 30, 42, 51, 40, 37, 34, 41, 47, 14, 39, 47, 46, 52, 42, 59, 55, 47, 63, 48, 54, 62, 56, 52, 54, 55, 58, 64, 61, 41, 64, 70, 67, 72] 0

k\_1000 544

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_4.sm case j1205\_4.sm

0 6.4370551109313965 s [97, 97] 0.0 [0, 0, 0, 0, 9, 7, 9, 39, 9, 23, 13, 26, 9, 13, 14, 23, 15, 16, 7, 13, 28, 7, 28, 47, 14, 12, 9, 19, 15, 22, 14, 41, 13, 20, 22, 28, 10, 29, 19, 13, 50, 19, 32, 9, 26, 24, 39, 33, 47, 19, 36, 23, 32, 16, 35, 19, 32, 21, 27, 56, 16, 36, 20, 21, 22, 32, 19, 26, 32, 22, 29, 22, 29, 42, 16, 20, 34, 48, 59, 44, 44, 30, 30, 30, 45, 45, 38, 42, 22, 35, 43, 37, 27, 13, 42, 46, 39, 55, 24, 13, 51, 62, 22, 51, 37, 67, 42, 32, 72, 26, 56, 65, 35, 55, 43, 61, 82, 73, 76, 48, 91, 97] 0

k\_1000 545

opm 77

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_5.sm case j1205\_5.sm

15 98.66060256958008 s [77, 109] 0.0 [0, 0, 0, 0, 6, 16, 6, 6, 6, 6, 6, 7, 11, 10, 10, 8, 10, 9, 13, 9, 14, 9, 16, 9, 14, 17, 17, 18, 9, 21, 13, 7, 7, 16, 16, 20, 16, 17, 17, 19, 16, 18, 16, 8, 8, 20, 26, 17, 21, 20, 20, 20, 11, 21, 26, 22, 26, 23, 18, 23, 18, 28, 28, 23, 15, 27, 26, 32, 25, 24, 23, 17, 36, 31, 22, 28, 28, 36, 33, 24, 24, 29, 32, 40, 28, 32, 37, 30, 31, 10, 38, 29, 39, 35, 42, 41, 36, 33, 37, 39, 27, 35, 38, 41, 43, 34, 45, 40, 44, 30, 50, 48, 37, 55, 55, 63, 51, 48, 57, 42, 71, 77] 0

k\_1000 546

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_6.sm case j1205\_6.sm

47 482.8414945602417 s [88, 104] 0.0 [0, 0, 0, 0, 8, 8, 6, 10, 6, 15, 8, 15, 15, 20, 6, 18, 11, 11, 20, 18, 22, 14, 22, 26, 24, 10, 26, 29, 26, 24, 24, 13, 14, 20, 15, 30, 36, 14, 13, 24, 17, 18, 16, 46, 21, 17, 28, 37, 14, 10, 17, 26, 22, 27, 18, 25, 32, 37, 22, 35, 21, 25, 36, 29, 47, 17, 36, 39, 49, 27, 36, 30, 54, 46, 56, 49, 36, 27, 42, 34, 43, 47, 32, 36, 52, 47, 39, 29, 52, 36, 60, 27, 18, 54, 45, 46, 57, 37, 55, 25, 18, 42, 42, 56, 63, 60, 55, 35, 58, 67, 46, 48, 51, 65, 65, 55, 69, 71, 79, 78, 77, 88] 0

k\_1000 547

opm 84

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_7.sm case j1205\_7.sm

0 8.052507400512695 s [84, 120] 0.0 [0, 0, 0, 0, 8, 10, 4, 8, 8, 16, 16, 16, 16, 10, 13, 10, 10, 23, 23, 18, 10, 13, 23, 44, 21, 11, 25, 57, 25, 19, 32, 20, 12, 21, 28, 28, 16, 32, 20, 23, 13, 26, 32, 25, 33, 25, 34, 35, 63, 24, 21, 16, 37, 37, 44, 31, 23, 25, 44, 16, 51, 33, 43, 20, 23, 27, 56, 35, 37, 36, 13, 27, 37, 19, 31, 19, 33, 53, 42, 44, 51, 24, 34, 52, 44, 43, 33, 43, 68, 53, 39, 52, 54, 51, 63, 18, 53, 57, 44, 34, 53, 28, 35, 62, 44, 36, 41, 51, 60, 66, 64, 59, 65, 69, 64, 63, 72, 66, 67, 77, 77, 84] 0

k\_1000 548

opm 78

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_8.sm case j1205\_8.sm

53 469.3652720451355 s [78, 88] 0.0 [0, 0, 0, 0, 2, 2, 10, 13, 6, 10, 6, 2, 7, 12, 22, 18, 18, 27, 21, 10, 4, 18, 12, 14, 4, 20, 30, 14, 21, 21, 14, 22, 12, 24, 20, 21, 9, 14, 9, 24, 31, 30, 40, 27, 9, 22, 19, 24, 29, 14, 19, 26, 21, 13, 30, 20, 20, 33, 21, 27, 7, 34, 26, 40, 44, 41, 46, 40, 26, 30, 34, 41, 36, 46, 45, 14, 27, 33, 33, 26, 35, 9, 41, 51, 36, 42, 41, 49, 11, 38, 38, 21, 48, 30, 50, 31, 52, 29, 56, 44, 50, 47, 56, 52, 25, 56, 32, 56, 65, 58, 59, 46, 52, 51, 67, 56, 58, 61, 74, 31, 71, 78] 0

k\_1000 549

opm 106

the random choice case path in j120 ./rcpsp/j120.sm/j1205\_9.sm case j1205\_9.sm

3 25.435755014419556 s [106, 107] 0.0 [0, 0, 0, 0, 10, 7, 7, 10, 11, 10, 18, 22, 13, 13, 14, 14, 27, 18, 18, 21, 30, 25, 23, 18, 14, 22, 22, 23, 11, 14, 33, 27, 36, 12, 30, 14, 13, 25, 21, 11, 21, 36, 46, 19, 35, 36, 30, 33, 27, 55, 37, 39, 23, 36, 24, 36, 39, 55, 57, 41, 49, 54, 55, 60, 55, 46, 41, 46, 20, 25, 57, 24, 54, 25, 56, 34, 46, 42, 64, 59, 49, 55, 61, 50, 64, 74, 29, 23, 7, 37, 59, 66, 60, 49, 58, 56, 65, 21, 72, 24, 71, 76, 70, 64, 77, 76, 79, 65, 21, 80, 83, 49, 63, 82, 76, 93, 88, 93, 102, 97, 85, 106] 0

k\_1000 550

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_1.sm case j12060\_1.sm

41 707.9046909809113 s [103, 117] 1.9801980198019802 [0, 0, 0, 0, 1, 1, 3, 3, 11, 18, 19, 1, 11, 14, 23, 15, 5, 3, 18, 14, 16, 5, 28, 15, 24, 33, 24, 25, 16, 6, 16, 19, 29, 5, 23, 10, 33, 6, 45, 23, 25, 16, 19, 46, 20, 26, 20, 26, 32, 33, 34, 60, 33, 29, 30, 36, 35, 28, 43, 39, 35, 40, 48, 53, 39, 22, 70, 50, 43, 48, 58, 6, 51, 42, 69, 53, 54, 48, 32, 58, 55, 46, 50, 56, 45, 51, 67, 51, 63, 63, 65, 60, 61, 71, 59, 61, 76, 80, 71, 79, 74, 70, 65, 79, 79, 66, 76, 71, 71, 84, 93, 80, 84, 80, 94, 78, 88, 98, 101, 99, 87, 103] 0

k\_1000 551

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_10.sm case j12060\_10.sm

56 717.5396740436554 s [94, 94] 5.617977528089887 [0, 0, 0, 0, 4, 10, 4, 8, 4, 12, 10, 6, 12, 19, 14, 8, 13, 18, 24, 16, 26, 29, 10, 10, 17, 35, 19, 12, 10, 16, 21, 39, 23, 29, 28, 41, 23, 33, 23, 14, 6, 48, 28, 30, 19, 23, 44, 33, 15, 32, 29, 37, 19, 39, 30, 29, 52, 38, 41, 48, 38, 45, 33, 20, 32, 43, 32, 47, 47, 35, 61, 57, 58, 62, 45, 57, 46, 46, 39, 53, 53, 63, 37, 60, 53, 59, 53, 54, 65, 63, 53, 48, 64, 67, 61, 72, 38, 72, 55, 67, 70, 67, 64, 66, 57, 69, 74, 64, 69, 67, 71, 64, 80, 78, 69, 83, 79, 84, 92, 72, 87, 94] 0

k\_1000 552

opm 83

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_2.sm case j12060\_2.sm

55 719.6599481105804 s [90, 92] 8.433734939759036 [0, 0, 0, 0, 1, 1, 8, 5, 6, 10, 8, 13, 6, 8, 18, 10, 21, 11, 16, 15, 22, 16, 18, 15, 29, 16, 14, 13, 10, 17, 22, 24, 18, 15, 29, 34, 17, 34, 37, 29, 21, 36, 26, 38, 44, 24, 20, 41, 25, 42, 52, 20, 27, 35, 36, 21, 45, 27, 34, 25, 36, 35, 46, 44, 46, 38, 41, 55, 57, 44, 48, 55, 49, 51, 41, 57, 55, 37, 61, 65, 65, 53, 50, 62, 54, 51, 67, 52, 59, 54, 54, 63, 62, 69, 64, 69, 59, 74, 67, 65, 69, 52, 71, 65, 69, 69, 70, 74, 76, 76, 74, 74, 70, 75, 79, 74, 82, 79, 79, 82, 83, 90] 0

k\_1000 553

opm 89

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_3.sm case j12060\_3.sm

42 719.3600625991821 s [95, 123] 6.741573033707865 [0, 0, 0, 0, 3, 8, 8, 7, 18, 12, 31, 10, 34, 15, 12, 19, 32, 15, 7, 15, 3, 18, 12, 38, 24, 26, 15, 24, 5, 28, 24, 6, 34, 32, 43, 6, 28, 10, 19, 19, 17, 38, 39, 38, 26, 50, 45, 46, 36, 39, 37, 32, 67, 50, 17, 50, 45, 47, 27, 49, 37, 52, 52, 47, 41, 45, 52, 51, 46, 55, 49, 65, 56, 49, 58, 62, 65, 39, 68, 71, 65, 67, 74, 55, 55, 58, 68, 75, 80, 61, 65, 73, 71, 71, 78, 79, 71, 59, 59, 85, 70, 79, 67, 72, 58, 72, 73, 80, 81, 75, 88, 81, 83, 71, 83, 93, 84, 87, 87, 81, 94, 95] 0

k\_1000 554

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_4.sm case j12060\_4.sm

40 719.2666692733765 s [108, 124] 4.854368932038835 [0, 0, 0, 0, 4, 4, 5, 8, 5, 5, 14, 7, 14, 16, 16, 16, 4, 25, 33, 22, 9, 33, 21, 36, 41, 21, 19, 48, 9, 15, 27, 46, 25, 39, 28, 28, 33, 41, 29, 16, 36, 46, 27, 60, 43, 59, 32, 62, 45, 53, 21, 10, 44, 38, 44, 48, 48, 53, 41, 55, 31, 56, 56, 70, 66, 62, 71, 76, 58, 77, 45, 47, 92, 67, 67, 31, 76, 43, 60, 47, 65, 71, 48, 58, 56, 65, 48, 77, 62, 80, 84, 65, 71, 79, 79, 65, 89, 80, 88, 85, 93, 55, 71, 70, 72, 70, 95, 61, 89, 74, 91, 84, 91, 88, 94, 96, 92, 101, 104, 98, 95, 108] 0

k\_1000 555

opm 105

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_5.sm case j12060\_5.sm

34 705.4020736217499 s [120, 160] 14.285714285714285 [0, 0, 0, 0, 9, 16, 2, 2, 2, 13, 26, 16, 26, 9, 55, 12, 23, 33, 28, 37, 16, 59, 24, 28, 34, 30, 23, 21, 31, 42, 22, 32, 19, 50, 31, 60, 37, 64, 22, 41, 37, 28, 51, 9, 44, 26, 25, 59, 41, 49, 67, 44, 46, 61, 68, 57, 61, 59, 63, 76, 52, 48, 51, 76, 69, 81, 44, 77, 67, 56, 48, 75, 84, 84, 51, 74, 80, 64, 61, 53, 49, 93, 70, 70, 89, 74, 89, 100, 82, 105, 84, 86, 94, 84, 102, 104, 94, 89, 70, 73, 93, 98, 61, 112, 75, 93, 99, 94, 81, 93, 100, 111, 94, 105, 100, 116, 104, 107, 118, 114, 114, 120] 0

k\_1000 556

opm 110

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_6.sm case j12060\_6.sm

44 702.4158239364624 s [117, 184] 6.363636363636363 [0, 0, 0, 0, 6, 6, 6, 6, 10, 16, 4, 4, 6, 18, 14, 13, 30, 25, 17, 26, 34, 13, 16, 40, 9, 13, 4, 46, 18, 32, 24, 26, 18, 56, 11, 25, 18, 23, 24, 44, 30, 19, 35, 91, 52, 42, 29, 49, 13, 9, 34, 35, 44, 63, 43, 52, 69, 37, 47, 42, 53, 41, 58, 59, 60, 49, 49, 61, 57, 60, 65, 66, 60, 34, 56, 57, 56, 68, 57, 69, 64, 65, 65, 74, 66, 71, 69, 73, 76, 79, 71, 79, 60, 73, 73, 82, 74, 88, 71, 95, 85, 83, 86, 78, 85, 91, 100, 96, 79, 96, 96, 102, 104, 82, 83, 90, 111, 87, 112, 100, 113, 117] 0

k\_1000 557

opm 94

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_7.sm case j12060\_7.sm

36 707.9415652751923 s [104, 132] 10.638297872340425 [0, 0, 0, 0, 8, 5, 8, 15, 15, 10, 16, 19, 49, 28, 16, 10, 12, 21, 26, 10, 22, 6, 21, 12, 12, 9, 23, 23, 23, 8, 22, 19, 22, 30, 31, 28, 31, 36, 33, 59, 32, 61, 22, 51, 35, 39, 36, 57, 32, 35, 40, 39, 16, 58, 45, 31, 42, 49, 49, 45, 66, 66, 59, 30, 69, 41, 14, 38, 77, 79, 77, 55, 51, 47, 42, 46, 58, 68, 61, 65, 30, 55, 61, 66, 59, 45, 66, 79, 51, 61, 78, 60, 78, 76, 69, 62, 70, 77, 83, 73, 69, 78, 65, 76, 87, 83, 77, 77, 97, 99, 83, 83, 85, 71, 91, 90, 92, 92, 97, 94, 100, 104] 0

k\_1000 558

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_8.sm case j12060\_8.sm

55 713.1670708656311 s [108, 133] 6.9306930693069315 [0, 0, 0, 0, 5, 4, 4, 7, 7, 14, 11, 9, 10, 11, 5, 14, 6, 16, 23, 29, 18, 38, 30, 56, 23, 34, 13, 39, 35, 12, 17, 18, 14, 23, 23, 17, 32, 26, 42, 15, 24, 67, 16, 7, 33, 34, 32, 38, 27, 28, 31, 29, 44, 40, 38, 46, 58, 48, 36, 47, 43, 54, 63, 59, 34, 31, 24, 40, 44, 54, 64, 51, 71, 76, 14, 64, 40, 53, 51, 43, 50, 58, 78, 56, 78, 57, 74, 58, 67, 64, 69, 68, 83, 64, 51, 61, 75, 64, 64, 74, 70, 79, 71, 71, 72, 73, 80, 89, 68, 74, 83, 88, 87, 85, 90, 92, 67, 94, 100, 87, 100, 108] 0

k\_1000 559

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j12060\_9.sm case j12060\_9.sm

56 720.6514508724213 s [105, 137] 3.9603960396039604 [0, 0, 0, 0, 9, 1, 2, 9, 2, 17, 2, 12, 20, 20, 1, 3, 9, 18, 19, 11, 11, 25, 11, 15, 31, 17, 16, 8, 12, 43, 31, 25, 44, 19, 26, 25, 41, 26, 3, 39, 37, 32, 23, 61, 53, 34, 32, 18, 21, 26, 32, 26, 25, 30, 31, 25, 33, 40, 42, 16, 53, 49, 37, 41, 30, 52, 41, 67, 63, 60, 51, 19, 51, 23, 65, 40, 38, 49, 40, 60, 61, 35, 67, 70, 47, 57, 74, 70, 57, 57, 50, 57, 77, 63, 71, 63, 72, 63, 55, 74, 60, 73, 76, 69, 69, 76, 73, 81, 83, 79, 73, 80, 92, 89, 94, 84, 80, 83, 102, 96, 83, 105] 0

k\_1000 560

opm 132

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_1.sm case j1206\_1.sm

11 861.4765567779541 s [166, 169] 25.757575757575758 [0, 0, 0, 0, 9, 10, 8, 16, 9, 25, 22, 10, 11, 28, 10, 22, 36, 8, 43, 19, 9, 31, 19, 20, 37, 35, 37, 47, 43, 24, 41, 73, 51, 103, 31, 56, 49, 48, 31, 46, 64, 73, 65, 62, 24, 105, 85, 89, 83, 51, 123, 41, 52, 48, 64, 94, 34, 14, 51, 52, 86, 81, 50, 62, 109, 103, 103, 75, 63, 82, 115, 4, 41, 36, 123, 138, 138, 63, 59, 14, 86, 59, 94, 47, 29, 96, 105, 50, 141, 61, 117, 94, 115, 69, 127, 81, 65, 135, 59, 90, 141, 102, 117, 70, 147, 123, 127, 105, 71, 133, 147, 73, 135, 142, 144, 149, 154, 154, 159, 159, 156, 166] 0

k\_1000 561

opm 156

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_10.sm case j1206\_10.sm

11 1339.1555552482605 s [200, 710] 28.205128205128204 [0, 82, 0, 0, 6, 6, 12, 24, 6, 33, 39, 63, 12, 36, 8, 8, 51, 102, 32, 49, 8, 56, 57, 42, 13, 39, 42, 63, 26, 57, 71, 18, 24, 10, 86, 9, 75, 12, 93, 92, 51, 82, 9, 99, 116, 32, 102, 93, 80, 106, 81, 18, 57, 75, 63, 126, 97, 49, 99, 126, 63, 132, 71, 111, 136, 103, 64, 33, 71, 106, 57, 65, 106, 125, 18, 41, 137, 126, 142, 57, 145, 147, 81, 26, 18, 132, 56, 131, 137, 147, 164, 137, 116, 49, 150, 134, 71, 173, 80, 148, 148, 168, 150, 165, 150, 111, 159, 168, 108, 176, 178, 159, 178, 158, 183, 168, 187, 187, 190, 190, 193, 200] 0

k\_1000 562

opm 125

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_2.sm case j1206\_2.sm

12 661.3354182243347 s [156, 194] 24.8 [0, 0, 0, 0, 7, 11, 17, 7, 12, 13, 3, 22, 45, 17, 22, 7, 54, 37, 11, 14, 22, 24, 17, 28, 54, 12, 23, 23, 74, 83, 36, 72, 33, 16, 45, 61, 62, 79, 80, 66, 29, 62, 25, 17, 24, 51, 61, 88, 46, 17, 29, 89, 91, 74, 95, 97, 53, 25, 24, 86, 86, 30, 76, 87, 105, 89, 91, 95, 66, 107, 64, 72, 107, 54, 107, 110, 79, 79, 22, 36, 82, 86, 28, 91, 75, 115, 85, 97, 116, 103, 116, 43, 69, 80, 119, 120, 137, 123, 148, 110, 126, 113, 118, 125, 110, 102, 136, 116, 126, 151, 132, 137, 117, 139, 120, 123, 139, 144, 143, 145, 153, 156] 0

k\_1000 563

opm 135

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_3.sm case j1206\_3.sm

11 977.5921497344971 s [166, 356] 22.962962962962962 [0, 0, 0, 0, 9, 10, 52, 3, 3, 9, 9, 13, 10, 19, 35, 61, 21, 9, 24, 26, 3, 61, 41, 26, 48, 27, 14, 24, 71, 92, 14, 36, 65, 15, 33, 18, 44, 24, 15, 44, 9, 48, 41, 23, 21, 18, 26, 78, 80, 124, 42, 60, 61, 14, 65, 33, 65, 48, 73, 9, 92, 101, 92, 35, 35, 71, 56, 60, 88, 21, 53, 64, 32, 64, 106, 80, 76, 92, 61, 19, 78, 42, 107, 22, 22, 114, 137, 23, 83, 53, 73, 100, 109, 95, 40, 92, 92, 106, 52, 45, 100, 54, 107, 60, 154, 116, 125, 128, 138, 132, 107, 137, 100, 146, 147, 154, 147, 155, 148, 152, 160, 166] 0

k\_1000 564

opm 151

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_4.sm case j1206\_4.sm

11 1249.2282330989838 s [189, 285] 25.165562913907287 [0, 20, 0, 0, 2, 10, 11, 29, 21, 2, 21, 29, 11, 29, 35, 77, 10, 53, 10, 20, 39, 70, 20, 91, 95, 29, 13, 82, 24, 25, 48, 28, 45, 53, 28, 70, 25, 61, 99, 61, 61, 129, 77, 3, 39, 77, 25, 10, 35, 118, 24, 24, 161, 61, 61, 2, 105, 38, 105, 66, 70, 79, 79, 127, 36, 85, 109, 95, 53, 99, 39, 86, 71, 121, 10, 105, 118, 85, 85, 19, 145, 85, 177, 139, 88, 114, 118, 69, 127, 39, 83, 145, 155, 109, 19, 179, 119, 50, 127, 155, 12, 114, 105, 159, 155, 159, 170, 167, 111, 79, 130, 163, 37, 139, 165, 150, 177, 172, 183, 184, 173, 189] 0

k\_1000 565

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_5.sm case j1206\_5.sm

12 670.0929462909698 s [145, 228] 26.08695652173913 [0, 0, 0, 20, 3, 28, 4, 9, 4, 3, 3, 28, 14, 12, 7, 25, 35, 14, 35, 79, 36, 9, 50, 45, 87, 43, 93, 43, 56, 9, 4, 7, 44, 51, 7, 85, 55, 60, 18, 28, 65, 97, 19, 55, 90, 65, 19, 18, 32, 65, 70, 44, 49, 85, 19, 56, 74, 79, 47, 51, 93, 59, 32, 93, 41, 70, 74, 65, 9, 96, 105, 79, 23, 81, 109, 9, 55, 93, 93, 25, 97, 71, 115, 106, 100, 80, 13, 94, 108, 61, 114, 96, 76, 96, 104, 65, 58, 114, 106, 100, 125, 27, 111, 111, 112, 121, 114, 93, 123, 132, 111, 108, 121, 124, 123, 132, 28, 128, 142, 134, 134, 145] 0

k\_1000 566

opm 140

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_6.sm case j1206\_6.sm

11 1101.7328715324402 s [184, 253] 31.428571428571427 [0, 0, 0, 0, 5, 2, 2, 55, 2, 8, 14, 1, 8, 2, 22, 46, 18, 2, 18, 77, 30, 5, 5, 8, 17, 62, 2, 9, 20, 36, 57, 34, 64, 30, 17, 30, 46, 22, 42, 82, 54, 62, 46, 17, 22, 73, 27, 34, 35, 101, 86, 54, 110, 93, 116, 87, 64, 99, 30, 64, 64, 138, 11, 42, 126, 64, 24, 42, 146, 93, 37, 94, 35, 36, 94, 77, 64, 9, 134, 28, 68, 30, 144, 73, 44, 81, 126, 101, 109, 82, 87, 104, 134, 46, 146, 92, 138, 72, 116, 104, 72, 152, 120, 50, 166, 158, 158, 106, 130, 106, 138, 130, 154, 176, 158, 152, 162, 166, 176, 183, 172, 184] 0

k\_1000 567

opm 154

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_7.sm case j1206\_7.sm

11 1051.2883994579315 s [203, 903] 31.818181818181817 [0, 0, 0, 3, 14, 31, 12, 12, 36, 14, 20, 21, 23, 25, 25, 36, 23, 36, 20, 29, 36, 42, 14, 31, 43, 29, 43, 48, 28, 59, 65, 74, 12, 65, 29, 51, 42, 81, 78, 117, 81, 7, 126, 74, 81, 13, 59, 89, 74, 134, 88, 125, 3, 147, 84, 21, 44, 136, 126, 94, 84, 156, 36, 134, 60, 88, 99, 140, 51, 18, 104, 104, 140, 31, 52, 144, 106, 7, 151, 91, 51, 51, 99, 99, 161, 146, 156, 136, 106, 164, 116, 64, 46, 53, 132, 88, 164, 94, 125, 22, 60, 114, 146, 176, 98, 158, 117, 151, 132, 144, 184, 151, 112, 161, 146, 192, 99, 172, 194, 166, 157, 203] 0

k\_1000 568

opm 140

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_8.sm case j1206\_8.sm

11 906.2615151405334 s [191, 351] 36.42857142857142 [0, 0, 0, 9, 22, 18, 38, 45, 11, 7, 55, 52, 6, 13, 13, 69, 6, 12, 22, 28, 28, 26, 9, 22, 37, 26, 38, 31, 31, 59, 35, 77, 45, 52, 93, 38, 51, 36, 33, 59, 45, 73, 62, 43, 42, 157, 77, 50, 33, 43, 77, 62, 42, 86, 22, 72, 108, 100, 72, 45, 110, 76, 33, 35, 59, 100, 40, 31, 108, 62, 120, 120, 83, 89, 130, 84, 33, 11, 37, 90, 176, 134, 42, 144, 31, 130, 129, 112, 144, 62, 43, 152, 91, 147, 72, 153, 166, 87, 110, 55, 69, 166, 120, 156, 86, 156, 91, 98, 144, 174, 163, 151, 137, 175, 174, 166, 176, 182, 183, 182, 178, 191] 0

k\_1000 569

opm 145

the random choice case path in j120 ./rcpsp/j120.sm/j1206\_9.sm case j1206\_9.sm

11 912.6816618442535 s [192, 208] 32.41379310344827 [0, 0, 50, 0, 7, 59, 11, 21, 40, 30, 16, 30, 71, 61, 31, 80, 31, 31, 34, 35, 42, 40, 80, 52, 54, 75, 55, 7, 52, 82, 43, 61, 10, 134, 90, 146, 138, 138, 115, 101, 82, 7, 92, 123, 7, 16, 75, 55, 62, 143, 33, 16, 54, 104, 91, 16, 80, 65, 30, 92, 21, 90, 75, 110, 119, 125, 110, 12, 10, 110, 110, 111, 115, 65, 95, 13, 134, 151, 104, 132, 95, 40, 88, 147, 161, 142, 118, 98, 63, 102, 159, 156, 125, 141, 103, 148, 146, 42, 55, 148, 163, 92, 115, 113, 142, 119, 169, 156, 166, 98, 161, 173, 152, 161, 167, 177, 154, 184, 173, 190, 182, 192] 0

k\_1000 570

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_1.sm case j1207\_1.sm

18 693.7777850627899 s [116, 187] 19.587628865979383 [0, 0, 0, 0, 1, 1, 5, 1, 10, 13, 5, 9, 10, 14, 19, 21, 25, 10, 34, 5, 20, 10, 30, 34, 5, 14, 5, 41, 15, 7, 40, 22, 59, 44, 21, 24, 12, 13, 50, 17, 31, 50, 41, 15, 28, 7, 22, 14, 9, 6, 55, 38, 55, 69, 13, 31, 59, 31, 34, 47, 33, 62, 48, 34, 38, 33, 55, 54, 65, 62, 70, 76, 79, 43, 82, 48, 58, 62, 6, 90, 70, 70, 79, 69, 48, 11, 79, 64, 73, 65, 71, 85, 79, 75, 80, 65, 38, 80, 26, 86, 80, 54, 91, 86, 99, 90, 94, 75, 79, 99, 94, 91, 98, 65, 103, 103, 104, 100, 99, 107, 114, 116] 0

k\_1000 571

opm 110

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_10.sm case j1207\_10.sm

13 680.3875908851624 s [143, 178] 30.0 [0, 0, 0, 0, 4, 10, 4, 10, 10, 18, 3, 18, 18, 20, 21, 3, 24, 19, 31, 10, 21, 31, 25, 40, 8, 25, 41, 35, 50, 25, 53, 50, 48, 55, 27, 15, 27, 11, 33, 56, 5, 5, 47, 58, 65, 24, 14, 81, 70, 41, 57, 20, 75, 41, 41, 40, 17, 84, 34, 56, 72, 42, 60, 72, 55, 51, 34, 61, 60, 37, 16, 47, 53, 62, 80, 82, 62, 58, 51, 85, 24, 73, 86, 92, 91, 65, 51, 93, 102, 120, 19, 25, 51, 108, 112, 103, 101, 84, 119, 86, 73, 40, 42, 65, 82, 91, 51, 55, 112, 115, 125, 125, 112, 93, 125, 131, 116, 112, 132, 136, 126, 143] 0

k\_1000 572

opm 113

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_2.sm case j1207\_2.sm

20 734.4786448478699 s [134, 162] 18.58407079646018 [0, 0, 0, 0, 3, 13, 1, 22, 13, 20, 9, 1, 9, 24, 27, 27, 24, 3, 3, 34, 3, 27, 9, 31, 20, 7, 26, 3, 3, 38, 29, 22, 22, 45, 12, 7, 13, 13, 32, 50, 48, 34, 42, 26, 40, 38, 30, 41, 44, 42, 18, 12, 53, 68, 38, 27, 17, 31, 61, 9, 47, 54, 7, 45, 34, 53, 34, 67, 38, 61, 9, 16, 21, 61, 45, 13, 61, 103, 87, 45, 77, 85, 16, 97, 47, 44, 77, 102, 54, 33, 9, 64, 42, 80, 53, 87, 16, 27, 71, 71, 94, 57, 73, 87, 94, 65, 102, 94, 9, 94, 105, 100, 102, 87, 115, 67, 102, 110, 114, 103, 124, 134] 0

k\_1000 573

opm 97

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_3.sm case j1207\_3.sm

24 724.2591090202332 s [122, 132] 25.773195876288657 [0, 0, 0, 0, 2, 2, 3, 3, 3, 7, 10, 2, 12, 3, 7, 9, 3, 2, 7, 10, 9, 10, 7, 9, 15, 22, 19, 20, 43, 19, 49, 12, 33, 3, 18, 28, 52, 3, 28, 24, 35, 35, 28, 5, 6, 10, 22, 10, 40, 49, 33, 66, 18, 53, 26, 16, 2, 10, 49, 56, 16, 51, 50, 26, 36, 34, 60, 18, 12, 43, 10, 33, 15, 60, 61, 34, 49, 29, 62, 14, 20, 11, 9, 28, 75, 56, 66, 84, 71, 56, 76, 66, 71, 84, 37, 80, 53, 76, 85, 72, 38, 80, 44, 87, 84, 57, 93, 80, 66, 85, 96, 96, 51, 86, 59, 102, 99, 108, 115, 102, 62, 122] 0

k\_1000 574

opm 103

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_4.sm case j1207\_4.sm

20 718.4305400848389 s [130, 134] 26.21359223300971 [0, 0, 0, 0, 8, 8, 12, 3, 7, 15, 16, 27, 34, 3, 17, 23, 23, 30, 41, 32, 7, 38, 38, 38, 8, 45, 8, 18, 15, 47, 9, 24, 50, 26, 32, 30, 55, 6, 34, 16, 9, 48, 53, 39, 62, 45, 12, 25, 39, 24, 35, 17, 41, 52, 48, 67, 86, 69, 95, 74, 62, 73, 16, 58, 62, 25, 70, 73, 34, 87, 58, 69, 74, 79, 90, 54, 25, 93, 73, 84, 90, 14, 71, 109, 46, 93, 77, 68, 91, 89, 91, 96, 98, 47, 77, 99, 106, 103, 76, 96, 78, 108, 30, 101, 114, 113, 95, 58, 116, 108, 109, 114, 117, 53, 117, 123, 74, 121, 113, 128, 125, 130] 0

k\_1000 575

opm 123

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_5.sm case j1207\_5.sm

20 658.521036863327 s [157, 224] 27.64227642276423 [0, 0, 8, 0, 35, 14, 8, 9, 44, 52, 12, 23, 30, 20, 44, 62, 49, 67, 49, 46, 48, 37, 30, 59, 54, 28, 22, 30, 20, 77, 9, 48, 48, 70, 63, 93, 59, 30, 77, 30, 33, 81, 58, 27, 48, 91, 52, 12, 96, 12, 54, 72, 78, 32, 55, 73, 15, 88, 111, 36, 83, 36, 91, 86, 99, 101, 45, 112, 19, 83, 86, 104, 36, 103, 91, 101, 73, 78, 111, 104, 58, 113, 129, 77, 70, 96, 120, 72, 61, 110, 112, 95, 53, 23, 37, 132, 119, 141, 90, 104, 119, 129, 132, 141, 113, 112, 150, 141, 122, 112, 146, 136, 136, 144, 151, 129, 115, 146, 154, 147, 154, 157] 0

k\_1000 576

opm 115

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_6.sm case j1207\_6.sm

11 730.1189303398132 s [146, 152] 26.956521739130434 [0, 0, 0, 0, 5, 9, 13, 13, 5, 48, 11, 25, 9, 23, 9, 32, 33, 19, 19, 25, 50, 7, 41, 46, 42, 9, 9, 19, 15, 15, 15, 51, 33, 27, 25, 8, 22, 55, 41, 32, 33, 55, 67, 41, 50, 35, 72, 33, 42, 69, 64, 43, 58, 9, 23, 64, 27, 42, 47, 55, 47, 78, 57, 71, 61, 77, 19, 66, 42, 61, 19, 48, 81, 23, 58, 86, 63, 68, 61, 68, 80, 46, 72, 64, 64, 70, 35, 105, 96, 78, 89, 33, 92, 25, 89, 92, 96, 109, 109, 81, 102, 110, 118, 119, 122, 122, 131, 89, 110, 88, 131, 128, 109, 113, 122, 129, 113, 133, 140, 139, 139, 146] 0

k\_1000 577

opm 112

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_7.sm case j1207\_7.sm

16 750.21768450737 s [140, 162] 25.0 [0, 0, 0, 0, 9, 9, 8, 14, 14, 14, 13, 21, 24, 24, 8, 13, 13, 18, 21, 28, 23, 34, 17, 23, 24, 34, 42, 47, 59, 24, 21, 50, 40, 42, 33, 32, 60, 18, 29, 55, 37, 33, 67, 28, 42, 17, 19, 65, 39, 29, 39, 33, 42, 43, 73, 50, 60, 34, 29, 28, 50, 83, 60, 83, 50, 65, 59, 55, 67, 68, 105, 50, 73, 19, 64, 88, 83, 36, 29, 68, 84, 55, 81, 112, 71, 75, 58, 67, 57, 17, 93, 93, 88, 111, 89, 91, 74, 92, 81, 40, 88, 112, 89, 115, 124, 92, 107, 102, 85, 102, 98, 111, 119, 111, 120, 112, 126, 129, 129, 103, 136, 140] 0

k\_1000 578

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_8.sm case j1207\_8.sm

19 724.2925012111664 s [110, 131] 20.87912087912088 [0, 0, 0, 0, 6, 6, 15, 32, 6, 8, 11, 33, 11, 15, 6, 6, 17, 41, 11, 8, 41, 11, 11, 17, 17, 44, 29, 20, 14, 39, 34, 18, 3, 22, 26, 28, 24, 26, 33, 62, 38, 65, 22, 14, 71, 14, 38, 28, 28, 6, 29, 44, 3, 20, 48, 24, 51, 66, 48, 21, 51, 35, 6, 49, 69, 81, 34, 35, 55, 45, 68, 60, 8, 29, 32, 60, 59, 32, 71, 51, 72, 50, 79, 45, 80, 6, 15, 29, 66, 59, 51, 29, 75, 45, 65, 65, 17, 92, 20, 86, 72, 39, 81, 17, 58, 72, 86, 58, 88, 78, 93, 90, 59, 88, 92, 83, 96, 100, 99, 108, 93, 110] 0

k\_1000 579

opm 84

the random choice case path in j120 ./rcpsp/j120.sm/j1207\_9.sm case j1207\_9.sm

21 745.9585464000702 s [104, 151] 23.809523809523807 [0, 0, 0, 0, 1, 1, 2, 1, 9, 3, 14, 57, 9, 9, 15, 3, 21, 9, 13, 16, 4, 3, 18, 18, 3, 8, 18, 23, 20, 3, 26, 23, 14, 17, 26, 10, 7, 29, 29, 37, 43, 68, 19, 37, 20, 65, 25, 21, 28, 32, 25, 30, 30, 21, 47, 46, 48, 62, 31, 29, 4, 55, 33, 31, 46, 74, 58, 32, 39, 37, 75, 80, 53, 17, 31, 17, 48, 55, 43, 32, 37, 62, 23, 61, 52, 59, 39, 30, 24, 66, 39, 66, 48, 43, 48, 48, 33, 70, 57, 72, 80, 48, 81, 68, 65, 37, 72, 70, 82, 80, 82, 86, 81, 87, 89, 90, 90, 87, 97, 99, 91, 104] 0

k\_1000 580

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_1.sm case j1208\_1.sm

30 742.1308550834656 s [109, 109] 14.736842105263156 [0, 0, 0, 0, 2, 12, 6, 6, 2, 2, 10, 15, 12, 20, 24, 36, 45, 28, 45, 29, 10, 28, 10, 45, 17, 6, 11, 54, 58, 14, 16, 9, 20, 37, 12, 17, 26, 22, 54, 17, 14, 54, 24, 37, 27, 31, 31, 22, 49, 37, 20, 32, 22, 22, 43, 41, 26, 56, 55, 27, 32, 60, 42, 31, 38, 28, 20, 60, 54, 41, 45, 36, 46, 49, 32, 64, 42, 43, 53, 59, 49, 49, 55, 36, 60, 25, 53, 60, 60, 55, 41, 49, 68, 27, 64, 54, 74, 65, 71, 76, 76, 76, 64, 78, 84, 80, 60, 76, 76, 59, 61, 70, 71, 86, 91, 85, 75, 91, 92, 86, 101, 109] 0

k\_1000 581

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_10.sm case j1208\_10.sm

23 719.0933606624603 s [106, 174] 16.483516483516482 [0, 0, 0, 0, 7, 10, 4, 10, 17, 19, 10, 20, 20, 14, 29, 17, 20, 20, 28, 28, 34, 24, 26, 14, 32, 29, 25, 34, 30, 38, 22, 46, 25, 38, 42, 34, 38, 25, 52, 26, 28, 38, 54, 37, 35, 64, 22, 28, 14, 47, 43, 50, 34, 45, 30, 26, 36, 19, 37, 40, 58, 58, 38, 44, 22, 44, 62, 54, 52, 42, 53, 53, 4, 50, 65, 76, 50, 43, 44, 35, 62, 37, 62, 66, 63, 39, 74, 27, 53, 66, 7, 70, 64, 24, 75, 84, 70, 69, 81, 58, 73, 65, 67, 76, 64, 82, 87, 75, 72, 90, 71, 83, 76, 58, 68, 83, 94, 88, 81, 91, 97, 106] 0

k\_1000 582

opm 101

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_2.sm case j1208\_2.sm

18 682.8801145553589 s [126, 141] 24.752475247524753 [0, 0, 0, 0, 7, 10, 10, 17, 20, 9, 19, 26, 17, 13, 25, 19, 16, 27, 24, 12, 45, 56, 13, 33, 43, 76, 24, 19, 33, 7, 35, 32, 17, 50, 10, 23, 46, 40, 19, 25, 40, 69, 40, 73, 66, 16, 34, 19, 43, 22, 38, 28, 43, 25, 53, 20, 73, 44, 78, 24, 47, 22, 54, 66, 63, 73, 38, 46, 73, 81, 56, 63, 65, 27, 56, 78, 23, 79, 53, 47, 50, 83, 54, 81, 93, 19, 83, 23, 81, 69, 81, 81, 76, 29, 71, 63, 52, 29, 38, 86, 95, 73, 82, 59, 87, 89, 88, 98, 93, 90, 99, 99, 108, 81, 104, 102, 110, 115, 121, 106, 105, 126] 0

k\_1000 583

opm 95

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_3.sm case j1208\_3.sm

32 715.7489602565765 s [117, 125] 23.157894736842106 [0, 0, 0, 0, 8, 12, 12, 4, 22, 2, 28, 6, 8, 2, 22, 33, 14, 33, 14, 48, 14, 12, 51, 4, 28, 8, 6, 17, 33, 27, 48, 43, 18, 43, 17, 17, 28, 24, 27, 6, 27, 51, 33, 28, 43, 59, 47, 24, 6, 2, 33, 33, 18, 43, 27, 64, 48, 27, 53, 70, 11, 35, 62, 67, 68, 11, 29, 58, 14, 43, 33, 43, 35, 53, 43, 66, 70, 43, 23, 68, 67, 33, 78, 35, 64, 77, 73, 48, 68, 53, 86, 6, 87, 71, 55, 59, 60, 89, 73, 83, 89, 83, 59, 91, 94, 90, 69, 66, 79, 87, 98, 90, 97, 93, 96, 70, 102, 95, 93, 107, 103, 117] 0

k\_1000 584

opm 91

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_4.sm case j1208\_4.sm

16 747.6122574806213 s [117, 122] 28.57142857142857 [0, 0, 0, 0, 6, 1, 3, 6, 6, 48, 15, 19, 20, 22, 17, 32, 29, 20, 11, 25, 3, 21, 10, 15, 32, 35, 40, 32, 13, 12, 19, 28, 20, 52, 42, 3, 39, 37, 51, 11, 60, 39, 32, 51, 37, 61, 37, 75, 46, 58, 51, 46, 60, 13, 67, 69, 60, 10, 1, 70, 31, 36, 17, 29, 44, 39, 6, 48, 70, 33, 17, 60, 38, 52, 58, 60, 19, 60, 28, 39, 68, 75, 82, 67, 78, 82, 75, 86, 89, 52, 98, 22, 64, 83, 84, 40, 64, 36, 65, 30, 98, 71, 40, 70, 89, 78, 81, 84, 37, 95, 78, 58, 78, 100, 92, 100, 105, 102, 78, 115, 107, 117] 0

k\_1000 585

opm 99

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_5.sm case j1208\_5.sm

27 719.9369442462921 s [111, 201] 12.121212121212121 [0, 0, 0, 0, 7, 13, 9, 10, 20, 10, 7, 15, 15, 24, 20, 2, 7, 28, 15, 13, 23, 7, 38, 40, 20, 9, 44, 43, 9, 13, 20, 38, 46, 24, 29, 52, 33, 54, 33, 25, 10, 26, 17, 26, 28, 35, 37, 28, 32, 10, 35, 23, 54, 56, 51, 54, 46, 44, 46, 15, 48, 27, 53, 35, 44, 63, 41, 58, 45, 38, 56, 65, 28, 71, 60, 67, 33, 60, 70, 40, 70, 40, 67, 56, 65, 29, 52, 74, 76, 70, 78, 93, 94, 85, 61, 73, 63, 67, 85, 90, 100, 56, 50, 58, 90, 80, 94, 68, 103, 100, 105, 84, 97, 95, 102, 90, 99, 105, 108, 104, 103, 111] 0

k\_1000 586

opm 84

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_6.sm case j1208\_6.sm

30 721.7914986610413 s [100, 222] 19.047619047619047 [0, 0, 0, 0, 9, 15, 9, 9, 1, 21, 9, 21, 29, 1, 4, 1, 15, 14, 2, 14, 21, 23, 15, 14, 34, 34, 27, 17, 41, 4, 20, 45, 25, 23, 36, 64, 2, 21, 30, 16, 21, 2, 44, 42, 38, 31, 21, 40, 24, 48, 36, 47, 48, 24, 44, 29, 35, 51, 27, 66, 22, 41, 27, 38, 45, 50, 53, 34, 17, 35, 25, 47, 38, 56, 48, 33, 67, 24, 29, 60, 65, 38, 74, 60, 46, 56, 53, 44, 35, 60, 64, 21, 56, 31, 58, 56, 57, 70, 67, 68, 70, 79, 41, 74, 70, 48, 65, 48, 22, 75, 51, 83, 41, 66, 77, 73, 80, 81, 78, 79, 93, 100] 0

k\_1000 587

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_7.sm case j1208\_7.sm

17 703.8344304561615 s [105, 165] 20.689655172413794 [0, 0, 0, 0, 7, 4, 7, 9, 23, 10, 10, 14, 16, 75, 17, 13, 17, 9, 22, 13, 42, 17, 25, 21, 27, 32, 23, 27, 15, 23, 15, 26, 32, 31, 7, 31, 36, 31, 40, 43, 4, 20, 36, 51, 59, 30, 23, 55, 67, 4, 21, 31, 36, 15, 18, 34, 59, 33, 40, 30, 20, 34, 47, 45, 36, 69, 30, 51, 43, 7, 67, 34, 45, 35, 57, 53, 51, 74, 32, 58, 44, 84, 32, 39, 33, 59, 22, 26, 65, 59, 50, 36, 50, 30, 49, 79, 69, 76, 52, 45, 62, 76, 78, 58, 85, 59, 75, 79, 75, 94, 80, 51, 70, 70, 59, 80, 89, 85, 99, 95, 82, 105] 0

k\_1000 588

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_8.sm case j1208\_8.sm

30 700.4562692642212 s [90, 94] 3.4482758620689653 [0, 0, 0, 0, 4, 10, 11, 4, 14, 14, 11, 13, 6, 17, 6, 17, 22, 13, 22, 14, 14, 18, 11, 32, 22, 25, 4, 25, 29, 20, 29, 18, 13, 31, 35, 15, 17, 30, 18, 15, 15, 18, 21, 32, 14, 39, 22, 10, 45, 13, 37, 31, 28, 45, 45, 32, 13, 42, 35, 30, 14, 21, 20, 25, 41, 43, 54, 32, 48, 26, 20, 63, 41, 53, 21, 41, 72, 74, 42, 62, 34, 52, 26, 52, 70, 54, 48, 20, 58, 53, 32, 48, 26, 34, 58, 61, 48, 58, 62, 72, 52, 48, 27, 50, 74, 62, 68, 68, 63, 69, 73, 79, 70, 62, 80, 80, 71, 79, 87, 80, 82, 90] 0

k\_1000 589

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j1208\_9.sm case j1208\_9.sm

23 691.6448500156403 s [107, 134] 22.988505747126435 [0, 0, 0, 0, 7, 9, 7, 7, 7, 16, 67, 16, 16, 14, 9, 27, 10, 32, 20, 38, 14, 34, 45, 32, 14, 18, 48, 16, 8, 27, 29, 10, 20, 7, 28, 41, 10, 7, 42, 51, 21, 12, 11, 44, 55, 29, 58, 16, 47, 63, 35, 56, 53, 12, 77, 18, 63, 58, 18, 35, 27, 71, 37, 37, 57, 28, 39, 51, 35, 26, 64, 46, 29, 51, 33, 73, 63, 39, 29, 58, 73, 46, 83, 51, 88, 53, 29, 34, 41, 63, 83, 73, 63, 57, 44, 73, 61, 45, 65, 73, 80, 39, 86, 77, 76, 88, 81, 49, 74, 86, 90, 94, 93, 93, 95, 97, 101, 99, 102, 67, 103, 107] 0

k\_1000 590

opm 88

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_1.sm case j1209\_1.sm

34 709.68159532547 s [96, 104] 9.090909090909092 [0, 0, 0, 0, 6, 8, 9, 8, 17, 8, 9, 20, 27, 17, 27, 16, 21, 9, 9, 18, 29, 29, 23, 32, 61, 23, 27, 19, 33, 16, 24, 36, 45, 37, 29, 9, 12, 27, 27, 26, 38, 30, 9, 37, 11, 54, 9, 56, 50, 37, 41, 38, 32, 33, 37, 40, 30, 54, 39, 11, 20, 40, 37, 46, 68, 54, 41, 12, 37, 48, 45, 56, 69, 59, 38, 36, 30, 59, 61, 51, 45, 39, 48, 66, 40, 38, 24, 49, 61, 49, 74, 18, 61, 55, 39, 65, 65, 68, 63, 72, 70, 55, 78, 65, 39, 74, 82, 69, 54, 70, 73, 74, 78, 73, 86, 85, 85, 73, 93, 60, 92, 96] 0

k\_1000 591

opm 84

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_10.sm case j1209\_10.sm

27 727.1994054317474 s [91, 499] 8.333333333333332 [0, 0, 0, 0, 3, 1, 7, 7, 4, 6, 10, 7, 4, 20, 7, 6, 6, 14, 21, 13, 18, 11, 10, 19, 20, 10, 13, 6, 10, 11, 7, 1, 13, 11, 31, 13, 24, 18, 47, 21, 37, 47, 18, 26, 25, 21, 28, 33, 40, 26, 21, 37, 11, 36, 37, 49, 28, 14, 53, 43, 9, 15, 4, 15, 56, 17, 15, 28, 29, 21, 31, 20, 34, 33, 63, 52, 46, 65, 28, 68, 29, 43, 50, 10, 45, 29, 53, 13, 20, 34, 53, 48, 38, 58, 21, 60, 63, 60, 61, 34, 63, 68, 67, 71, 69, 75, 54, 62, 78, 43, 72, 69, 56, 77, 81, 78, 63, 85, 82, 90, 85, 91] 0

k\_1000 592

opm 94

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_2.sm case j1209\_2.sm

32 739.082496881485 s [97, 109] 3.1914893617021276 [0, 0, 0, 0, 4, 4, 5, 4, 8, 5, 21, 10, 15, 16, 16, 8, 16, 16, 30, 25, 16, 43, 14, 15, 8, 35, 10, 44, 26, 16, 39, 26, 18, 44, 21, 11, 22, 10, 39, 21, 26, 21, 61, 22, 30, 24, 29, 22, 29, 39, 25, 15, 14, 35, 50, 28, 52, 37, 45, 29, 36, 29, 5, 35, 18, 30, 61, 41, 24, 68, 53, 39, 43, 19, 70, 47, 30, 39, 44, 71, 46, 19, 33, 40, 54, 44, 39, 47, 48, 23, 48, 52, 61, 81, 71, 7, 53, 61, 63, 50, 35, 58, 65, 48, 63, 47, 58, 48, 68, 53, 68, 54, 78, 82, 65, 69, 68, 87, 89, 70, 90, 97] 0

k\_1000 593

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_3.sm case j1209\_3.sm

28 726.025402545929 s [91, 98] 4.597701149425287 [0, 0, 0, 0, 7, 1, 12, 8, 18, 24, 1, 7, 30, 2, 8, 24, 22, 28, 8, 32, 24, 33, 40, 40, 18, 43, 5, 2, 33, 14, 22, 21, 8, 7, 13, 8, 7, 32, 14, 32, 22, 40, 30, 17, 35, 38, 23, 14, 11, 23, 17, 23, 38, 24, 43, 37, 22, 37, 31, 19, 38, 21, 43, 45, 37, 19, 12, 46, 32, 6, 48, 52, 31, 40, 20, 24, 33, 52, 27, 40, 19, 53, 25, 43, 17, 52, 32, 52, 48, 7, 22, 60, 57, 45, 36, 22, 53, 69, 28, 69, 60, 53, 64, 54, 57, 70, 54, 54, 58, 66, 40, 46, 63, 74, 52, 73, 73, 78, 63, 76, 81, 91] 0

k\_1000 594

opm 84

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_4.sm case j1209\_4.sm

37 699.3757672309875 s [97, 129] 15.476190476190476 [0, 0, 0, 0, 6, 10, 13, 6, 13, 13, 21, 21, 30, 13, 31, 13, 37, 3, 3, 10, 3, 16, 14, 16, 20, 37, 14, 31, 7, 7, 31, 50, 14, 14, 23, 14, 59, 7, 33, 22, 10, 46, 31, 32, 21, 39, 32, 34, 24, 41, 68, 42, 49, 20, 71, 59, 14, 42, 22, 22, 30, 62, 22, 37, 30, 59, 22, 50, 50, 56, 55, 63, 24, 37, 34, 42, 42, 42, 53, 20, 65, 30, 37, 42, 48, 50, 42, 18, 72, 62, 29, 63, 31, 66, 24, 56, 56, 55, 40, 72, 72, 75, 65, 75, 75, 80, 72, 82, 83, 76, 68, 63, 70, 63, 80, 82, 55, 81, 89, 90, 84, 97] 0

k\_1000 595

opm 114

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_5.sm case j1209\_5.sm

2 22.420320749282837 s [114, 188] 0.0 [0, 0, 0, 0, 4, 14, 14, 22, 4, 29, 29, 35, 36, 14, 4, 9, 35, 41, 38, 13, 16, 41, 41, 47, 47, 13, 20, 20, 50, 52, 47, 9, 36, 9, 41, 43, 29, 2, 22, 36, 23, 41, 43, 41, 50, 56, 35, 27, 50, 11, 10, 22, 45, 47, 41, 49, 13, 55, 60, 50, 13, 20, 59, 57, 61, 23, 51, 52, 60, 21, 61, 23, 65, 61, 59, 65, 68, 33, 43, 50, 10, 32, 49, 57, 45, 60, 63, 78, 21, 79, 75, 69, 28, 55, 72, 72, 79, 64, 67, 81, 81, 86, 67, 86, 57, 91, 51, 91, 68, 94, 61, 95, 87, 96, 67, 85, 90, 93, 75, 105, 95, 114] 0

k\_1000 596

opm 98

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_6.sm case j1209\_6.sm

41 696.9132759571075 s [101, 159] 3.061224489795918 [0, 0, 0, 0, 8, 8, 15, 9, 15, 18, 15, 18, 19, 25, 25, 17, 18, 18, 22, 22, 7, 22, 25, 22, 23, 26, 31, 9, 30, 36, 19, 26, 27, 33, 24, 19, 19, 63, 36, 37, 53, 28, 64, 34, 39, 33, 43, 43, 26, 29, 35, 41, 36, 33, 33, 36, 19, 55, 43, 60, 37, 42, 55, 48, 39, 20, 42, 52, 51, 49, 45, 41, 28, 55, 37, 45, 41, 51, 35, 62, 18, 62, 57, 57, 51, 60, 66, 33, 65, 75, 69, 67, 22, 77, 75, 71, 55, 34, 51, 77, 77, 60, 63, 46, 59, 78, 79, 70, 80, 83, 43, 89, 29, 42, 83, 75, 92, 88, 98, 94, 77, 101] 0

k\_1000 597

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_7.sm case j1209\_7.sm

45 720.9552247524261 s [81, 94] 1.25 [0, 0, 0, 0, 8, 9, 7, 13, 15, 7, 15, 8, 13, 10, 14, 14, 16, 9, 20, 17, 17, 11, 16, 30, 14, 11, 36, 17, 23, 16, 38, 38, 17, 11, 31, 23, 41, 21, 25, 25, 25, 23, 39, 31, 21, 35, 17, 24, 33, 45, 31, 16, 24, 31, 31, 17, 29, 26, 26, 35, 38, 26, 30, 7, 45, 24, 21, 15, 25, 34, 36, 17, 38, 38, 42, 33, 38, 46, 36, 30, 26, 20, 31, 44, 43, 38, 44, 53, 27, 46, 38, 48, 53, 48, 49, 50, 38, 54, 47, 50, 50, 57, 35, 58, 55, 68, 42, 49, 45, 63, 64, 48, 58, 61, 58, 61, 69, 58, 71, 73, 65, 81] 0

k\_1000 598

opm 80

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_8.sm case j1209\_8.sm

42 717.134626865387 s [85, 119] 6.25 [0, 0, 0, 0, 9, 14, 4, 11, 20, 18, 19, 10, 4, 25, 8, 19, 9, 18, 15, 29, 17, 14, 15, 35, 25, 19, 14, 19, 26, 15, 20, 27, 37, 8, 27, 22, 27, 42, 25, 37, 24, 19, 47, 39, 30, 15, 35, 25, 9, 32, 8, 39, 32, 26, 44, 19, 45, 32, 27, 30, 34, 31, 30, 39, 15, 31, 42, 24, 33, 33, 47, 35, 44, 42, 34, 30, 23, 5, 35, 35, 35, 33, 37, 37, 34, 48, 51, 41, 60, 33, 37, 52, 45, 38, 42, 53, 52, 52, 35, 54, 51, 44, 59, 48, 36, 59, 62, 63, 56, 67, 61, 61, 59, 62, 55, 64, 70, 75, 82, 75, 70, 85] 0

k\_1000 599

opm 87

the random choice case path in j120 ./rcpsp/j120.sm/j1209\_9.sm case j1209\_9.sm

42 723.9687347412109 s [92, 136] 5.747126436781609 [0, 0, 0, 0, 5, 4, 7, 12, 23, 9, 18, 12, 5, 12, 18, 9, 28, 12, 5, 33, 7, 34, 4, 13, 10, 14, 7, 20, 41, 34, 18, 35, 12, 25, 28, 32, 41, 30, 4, 13, 31, 37, 51, 43, 20, 41, 14, 32, 14, 52, 43, 20, 41, 12, 35, 51, 48, 55, 35, 41, 20, 30, 25, 16, 44, 54, 36, 24, 44, 16, 31, 41, 21, 62, 16, 55, 52, 49, 62, 28, 56, 56, 54, 46, 29, 69, 41, 53, 21, 7, 65, 45, 58, 52, 58, 57, 61, 60, 56, 46, 64, 28, 64, 67, 63, 70, 61, 64, 67, 64, 72, 48, 68, 68, 76, 73, 71, 77, 67, 82, 80, 92] 0